

This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

#### Usage guidelines

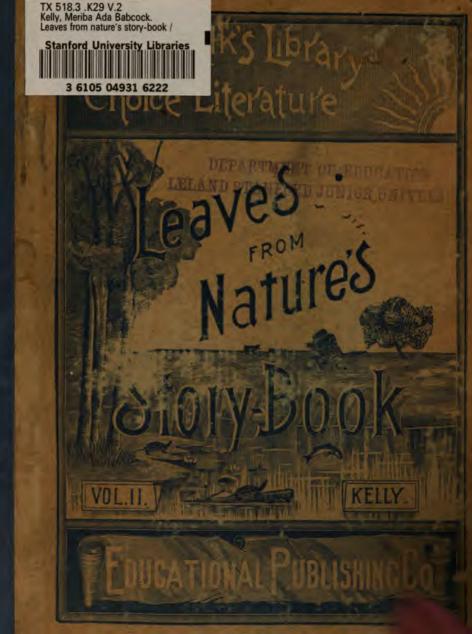
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + Refrain from automated querying Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

#### **About Google Book Search**

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at http://books.google.com/



#### PRESENTED BY THE PUBLISHERS

-TO THE-

#### TEXT-BOOK COLLECTION



TEXTBOOK COLLECTION GIFT OF

THE PUBLISHERS





Margaret E. Schallenberger,

Salar Carrier Carre

### **LEAVES**

FROM

## NATURE'S STORY-BOOK.

VOL. II.

By Mrs. M. A. B. KELLY,

State Normal College, Albany, N. Y.

Author of "A Volume of Poems," etc.

## DEPARTMENT OF EDUCATION LELAND STANFORD JUNIOR UNIVERSITY

EDUCATIONAL PUBLISHING COMPANY, BOSTON.

NEW YORK.

CHICAGO.

 $_{\rm MR8.~M.~A.~B.~Kelly,~Albany,~N.~Y.}$  621277

#### PREFACE.

In our Second Book, we shall listen to stories that will be hummed to us by the insect world; and each Order of insects will tell its own story, in its own simple way.

We shall hear about bird-life, too, from the gushing throats of the feathered warblers in their snug, leafy homes.

The fair flowers of field, forest, and garden shall lend their charms to our volume; and even the strange creatures, that are clad in scales and fins, shall leap up into the sunshine and the air, to tell us about their watery homes below.

And thus as we journey on, and on, we shall learn that the busy workers everywhere, in earth, air and water, each and all have a part in making up the the pleasing pages of Nature's great Story-Book.

M. A. B. KELLY.



PAG	_
	7
Rearing the Baby	14
The History of Mrs. Papilio	20
The History of Mrs. Bombyx	27
The Two Weavers	36
Mrs Lace Wing's Party (Part I.)	39
Mrs. Lace Wing's Party (Part 11.)	15
Mrs. Lace Wing's Party (Part III.)	3
Farmer Brown's Enemies	33
Seeing the World (Part I.)	73
Seeing the World (Part II)	32
Seeing the World (Part III)	4
The Water Tiger	)5
Real Fairies	9
A Busy Fairy Worker	6
Some Curious Bees	5
Net quite so Safe after All	17
Tit for Tat	16
Something More about Fairles	5
Review	5
Little Homespun's Robin	8
A Young Nest Thief	0
Something About Birds (Part I.)	7
Something About Birds (Part II.)	5
Lost Treasures	9
The Little Fisherman	)1
In Search of a Dinner	7
Food Hunters	3

#### SUGGESTIONS TO TEACHERS.

The author has deemed it unnecessary to place at the close of each story-lesson a set of studied questions. It is hoped that the subject-matter itself will prove of sufficient interest to awaken in the minds of both teacher and pupil a desire to consider and discuss the essential points presented.

Questions will naturally arise concerning the definition of words, terms, etc., and there will, perhaps, be a tendency on the part of some to inquire minutely into details.

The teacher should therefore make a careful study of each lesson before presenting it to her class as a supplementary exercise.

Natural History necessarily includes subjects in which children are deeply interested, and concerning which they are ever ready to ask questions.

In fact each querist, with his how and when, Would puzzle Huxley, o'er and o'er again.

How necessary, then, that the teacher prepare herself as thoroughly as possible to meet these earnest inquiries; for with her rests largely the responsibility of either encouraging or checking the spirit of research,—a spirit that if, properly directed, will lead on to the fullest measure of success.

A cautious hint here, a timely suggestion there, and the way is opened that shall bring the child into a condition of hearty sympathy and a close communion with nature and nature's God.

These suggestions are briefly given with a belief that the true teacher will recognize their importance, and accept them in the same cordial spirit in which they are submitted.



# LEAVES FROM NATURE'S STORY-BOOK.

II.



THE LITTLE MAKE-BELIEVE.

H, sister, do come quick, and help me catch this dear little humming-bird," cried Jennie, as she ran toward a cluster of honeysuckles in the lower end of the flower garden.

Her sister hurried to the spot just in time to see a handsome hawk moth flit away out of sight. The next day at twilight,—the usual hour at which these moths fly about,—the girls were waiting in the garden, and as soon as the insect came near enough, it was quickly caught in a little net which they had prepared for it.

This net was simply a long bag, made of gauze, and the mouth of it was held open by a wire ring which was fastened to a light, wooden handle.

With such a net, one may catch insects that are on the wing, without spoiling their beauty in the least.

They soon put their prize into a wide-mouthed bottle in which there was a poison that would kill it without much pain.

"This is far better than sticking pins through its body," said Jennie.

"I have seen people use pins in that way," said her sister, "and I think it is a very cruel thing to do."

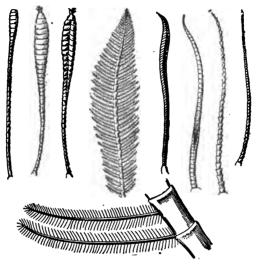
In a little while it ceased to move, and then it was taken out of the bottle and placed where they could examine it carefully.

"Why, it is only a make-believe bird, after all," said Jennie, as she held it up in her hand.



"Instead of two wings it has four; and in the place of two legs it has six,—and do look at its tiny feelers, and its great round eyes!"

"This insect is often called a hawk moth," said her sister. "But it is also rightly named the humming-bird moth.



NOTCHED AND FEATHERED ANTENNAE OF MOTHS (greatly magnified.,

"Notice its long, slender tongue, which is coiled up like a watch-spring. It is made up of two hollow tubes placed side by side, and when stretched out it is over four inches in length.

"When the moth is busy sipping sweets from the deep throats of the flowers, it does, indeed, look like a make-believe humming-bird, as you have said.

"These little feelers are called an-ten-nae, and when we speak of one of them, we call it an-ten-na. Some moths have antennae that look like tiny feathers, but this moth has them notched, or jointed.

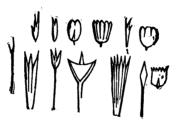
"This insect belongs to the same order as the butterfly family, but the butterfly has a knob on the end of each antennae, while the moth has none.

"These great round eyes that you see, are made up of many smaller ones, and it is said that this moth has more than three thousand eyes on each side of its head. There are also three small eyes on top of the head and so the insect is able to see better at this twilight hour than you or I can see at mid-day. In fact the sun seems to blind the eyes of moths, and so they usually fly at night.

"Moths and butterflies belong to the same Order.\*
This Order has a very long name. The true meaning of it is scale-wing, because there are many thousand scales on a single wing.

<sup>\*</sup> Lep-i-dop'-te-ra.

"These little scales lap over one another like the shingles on the roof of our house. Let me place one of them under a lens that will make them look larger, and then you will see how beautiful they are, both in form and color. It is the scales that clothe these insects in their gay dresses.



SCALES OF BUTTERFLY'S WING.

"You will see that this moth is clothed in scales of ashy gray. The large fore-wings are marked with many lines of brown, and the hind-wings, which are smaller, are streaked with dark, zigzag lines.

"Along the back are little tufts of brown, and on each side of the body you can count five orange colored spots."

"But how did this moth look when it was a baby?" asked Jennie.

"If you will wait till the last of August, you shall have a baby moth to rear," replied her sister, "and then you will see for yourself, which you like best, the baby, or the full-grown insect."



"And now that it is dead, we will run this long, slender pin right down through its back, between the wings, and fasten it to the stretching-board.

"There! now its body will lie in the groove that I have made along the centre of the board, while its wings are stretched out on either side. In about a week we can place it in the cabinet with our other treasures."



GATHERING TOMATOES.

#### REARING THE BABY.

#### PART II.

It was toward the very last of August before Jennie had a chance to find a baby humming-bird moth, and then it came to her when she was not looking for it.

One day when she was out in the garden, gathering tomatoes, she saw a large green worm crawling

over the vines, at the sight of which she screamed with fright and ran away.

You must know that she was greatly surprised when her sister told her that the ugly worm was a baby-moth, and the very thing that she had been so long looking for.

"It is not a worm at all, Jennie," she said, "because worms never change in form; they are always worms from the time they are born till they die.

"This creature is called the larva of the hummingbird moth. When we speak of two or more of them we call them larvae.

"You will see that its body is made up of eleven rings, and that it has sixteen feet. Notice the yellowish white bands that run from front to back on each of its sides; there are seven of them, and very pretty they are, too.

"It is not an ugly looking thing after all, and that sharp horn on the end of its body will do you no harm.

"This little creature never bites anything but the

leaves of plants with its two biting jaws that move sidewise. It feeds on the leaves of both the tomato and the potato, and no wonder that it has a stout body, for it is always hungry, and eats night and day."

"But where did this larva come from?" asked Jennie.

"It was hatched from a mite of an egg that was laid by a female moth on a leaf of the tomato vine in the garden.

"And now we will scatter some tomato leaves over this box of earth, and put our baby into the same box and see what it will do."

And so they carefully watched the little creature as it fed on the leaves, but at the end of three days it crept to one corner of the box and buried itself in the earth.

Jennie looked on in wonder. "Will it stay down there in the earth, and die?" she asked.

"Keep the box in a fairly warm place till next spring," said her sister, "and then you will see what a change has taken place in this fat, green baby of yours." Jennie thought it a long time to wait, and many a time during the winter months she looked at that corner in the little box where the larva had buried itself, but she neither saw nor heard any signs of life.

At last one bright morning in May, she noticed a movement in the earth that hid the little grave of the baby, and pretty soon the head and then the body of an ashy gray moth rose above the ground.

Slowly and feebly it crept along, for its wings were very limp and wrinkled up. Jennie's sister had nailed a little twig to the side of the box and soon the new-born moth crawled to the top of it, and holding on by its feet, its wings were left drooping and free.

And now Jennie saw a strange sight. The wings, which at first were not much larger than her thumbnail, began to grow larger and broader, while each of the little veins that crossed them everywhere were soon filled with a fluid from the stout worm-shaped body of the moth.

As the wings grew larger, the body became smaller and smaller, and in less than an hour Jennie clapped her hands with delight, for the handsome moth was able to try its wings in flight.

The baby had indeed wakened from its long sleep, but while it had lain there all alone in the ground, a strange thing had happened to it.

It had lost ten of its ugly legs, and the six legs that were left did not look at all as they did in the larva state. The sharp, curved horn that it had worn on the end of its body was gone too, and on each side of its body were two wings.

When Jennie dug carefully down into the earth where the baby had been all winter, she found an earthern cell, shaped something like a hen's egg.

In one end of the cell was the crumpled cast-off skin of the larva, and inside of the cell was a little brown case that looked like horn. One end of it was shaped like a small tube and Jennie soon found that it was a part of the case in which the long spiral tongue had rested.

It was a wonderful baby, indeed, that could go

down into the dark earth all alone and build its own cradle and make its own night-dress too!

Jennie soon learned that the little crumpled garment that she found in the earthen cell, was the old, dried skin of the larva, and that after that skin was cast off, the baby became a pupa, a word which means a baby, doll, or puppet.

Then when it grew too large to be any longer a pupa, it cast aside its pupa-case and came up out of the earth to fly about and live on the sweets of flowers.

Its wings, which were at first no larger than your thumb-nail, in less than one hour became so large that they would measure five inches from tip to tip, and its long tongue could be stretched out to almost the same length.

You may be sure that Jennie showed her prize to all of her young friends, and the next year in August, every one of them was hunting for a baby-moth "to bring up."



Bombyx," said a handsome swallow-tail butterfly, as she lit on a lilac bush in the garden.

This remark was made to a little silk-worm moth that was quietly resting on an Osage orange shrub, near by.

She had drawn her wings closely to her sides, as if to hide herself, as far as possible, from sight.

But the gaudy butterfly folded her wings gracefully together, and held them erect over her back, as if she thought them too fine to be hidden away where they could not be seen.

The little moth glanced down at her own plain attire. Her small wings had a dull, faded look, and there was not a single beauty spot anywhere about her small body of which she could boast.



SWALLOW-TAIL BUTTERFLY.

Then she glanced shyly at her fine neighbor. How handsome she was!

The upper part of her fore-wings were of a clear, pale yellow, striped with four black bands, and these bands were dotted with a row of eight bright yellow spots.

Her hind wings were a little smaller, but none the less beautiful. The ends were pointed in true swallow-tail style, while the scalloped borders were dotted with fine orange spots.

Her body was black, with a broad yellow stripe on either side, and as she flirted her wings in the sunshine, her bright colors flashed like jewels, and almost blinded the eyes of the poor moth, who all her life had kept as much as possible in the shade.

"What surprises me most of all," said the swallow-tail, "is the fact that you can be content to sit on that shrub and mope in the shade from morning till night; while I am always on the wing, and see so much that must be forever hidden from you.

"Would you believe it? In the last six hours I have not only visited forest and stream, but I have sipped honey from the sweetest flowers that bloom along the slopes of the hills, as well as from those that blossom in the grassy dells.

"Oh, it is a wonderful thing to see so much of

this beautiful world, and I ought to be truly giad that I was not born a stupid hermit like you."

To this taunt the poor moth had no chance to reply, for the gay butterfly hardly stopped to take breath as she went on.



MRS. PAPILIO AT REST.

"Even when I was an infant I was not content to stay in one place. I did not lie in the little green egg, from which I was hatched, longer than two weeks.

"When I came out of the shell, I was a small dark brown larval baby, with a large white spot on the middle of my back; and of course I was not nearly so beautiful as I am now.

"But after four days, I threw off that ugly dress and put on a new one, and very soon that became too small for me, so I had another, and then

I cast that aside and put on a third, and finally I had to wear a fourth. By that time I had reached my growth and I was glad of it.

"Each suit was larger and finer than the one that I laid aside, and some of them were very pretty indeed."

As the butterfly paused for a moment, it gave the moth a chance to ask, "And what did you live on, pray, that caused you to grow so fast?"

"You may be sure that I did not stay in one spot, and wait for my food to come to me," snapped out the swallow-tail quite sharply, as she opened and closed her handsome wings by way of keeping in motion even while she was resting.

"I was very hungry, and ate almost anything that I could find. I could have made a meal on the leaves of the apple-tree, the quince, the cherry, the plum, the oak, the ash, the willow, or the sassafras; and I was not above taking a nip, now and then from the juicy leaves of the carrot, and many other plants found in the garden.

"But at last I became tired of that kind of life; and so one day in June I fastened myself, by the tail, to a cherry twig, by means of some slender threads that I spun from the silk-glands of my own body.

"To make sure that I was safe, I threw a loop of silken thread around the middle of my body and made the end of the loop also fast to the twig.

"I soon threw off my handsome velvety green suit, and then my body was quite limp and soft; but in a short time my pupa-case hardened around me and kept me warm.

"In about a month the little case cracked open, and out I came.

"I was not long in finding use for my four pretty wings, although they looked dull and pinched up, at first; and I have been using them in the day time for nearly three weeks now without scarcely stopping to rest."

As the butterfly seemed to have nothing more to say about herself, the little moth said, in a very

timid tone, "Please, Mrs. Papilio, will you let me tell you how I happen to be here?"

"Oh, yes," said the butterfly, "if you will not tell too long a story;" and the moth began.



MOUTH OF THE HAWK MOTH (magnified.)

#### THE HISTORY OF MRS. BOMBYX.

"I belong to a very old family
In fact they were well known
more than four thousand years
ago. They lived in Asia
away across the sea.

"But there are a large number of them in this

country now, and very useful they are in the world, too.

"I was hatched from a very small yellowish egg that was no larger than the head of a pin.

"I have been told that my mother laid upwards of three hundred such eggs, although she was a moth no larger than I am.

"When I first came out of the little egg-shell my body was quite black, and I was covered with stiff hairs.

"You can easily see that I was not a very pretty

baby to look at, but I have changed a good deal since that time."

- "Ugh!" said the butterfly, trying to shrug her fore-wings, and the moth continued her story.
- "Like every other infant, I was hungry, and ate a good deal; but I craved only one kind of food, and that was the leaf of the mulberry tree.
- "I have no doubt but that I ate my own weight in mulberry leaves every day of my life; and, like yourself, I grew so large that I had to throw away my old dresses and put on newer and larger ones.
- "It just tired me out to pull off those tight suits, and sometimes I had to rest for a little while before I could begin to eat again.
- "I kept on growing larger and stouter till I had cast off my fourth suit, and then my body began to shrink a little, and I did not care to eat.
- "I was at that time about one month old, and though I was a mere baby I knew well how to build a little silken cradle for myself.
  - "So I went to work, and with two little spinning

tubes which were on my under lip, I spun a double thread of silk.

The silk came from two glands, one in each side of my body.

"Then I fastened this thread to a forked twig of a mulberry tree, so that I might have a strong support for my cocoon-cradle.



COCOON OF MOTH.

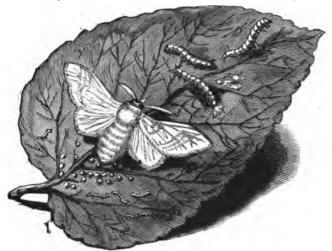
"As soon as I had made the thread fast to the twig, I continued to spin, and before my cradle was done, I had spun a thread of silk more than a quarter of a mile in length."

Here the butterfly gave her wings a little jerk as if she could hardly give credit to what the moth was saying.

"It is really true," said the moth, "and some of my family have spun threads even longer than that.

- "My cocoon was oval in shape, and looked like a strong, tough pod; while the outside was covered with a pale, yellow silk floss.
- "It was fully three days before it was all done, but at last it was safely woven all around me, and there I lay quite alone, inside of my silken cradle.
- "I cast off my baby-clothes, and pretty soon I began to feel very stupid, and in about three days' time I was fast asleep.
- "My pupa-case had grown to be quite stiff and hard, and when I awoke at the end of three weeks, I had to crack it open in order to get out."
- "But how did you escape from the little silken cradle?" asked the butterfly.
- "I was about to tell you," answered the moth.
  "I poured out from my body a strong, sour fluid, and this fluid softened the threads of my cocoon so that I could push them apart, and very soon I came out into the open air.
- "I was quite weak and limp at first; but after a time I could walk about very well."

"And do you never fly?" questioned her neighbor, who had listened to her story with much interest.



STAGES OF THE SILK-WORM.

"No," replied the moth, "the family to which I belong were all brought up to stay at home, and so we have no wish to be on the wing."

"Of what use then are your wings" asked Mistress Papilio, rather sharply.

"They are of very little use," answered the moth, "as I seldom try them; although I did take a short flight to that little mulberry bough yonder, in order to lay some eggs there this morning.

"There are some members of my family that are quite fond of these Osage orange leaves, but the mulberry is our natural food, after all."

"And what will you do next?" queried the butterfly.

"I cannot expect to live many days, now that my eggs are laid," replied the humble moth, "in fact, I am ready to die at almost any time."

"But what will become of your eggs?" enquired her neighbor.

"They will hatch out baby larvae that will spin a silken cocoon as I did; but," she added with a little sigh, "they will all be killed by being placed in the hot sunshine, or in some other way, before they can get out."

"That will be a very cruel thing," replied the butterfly, opening and shutting her swallow-tail wings uneasily.

"Yes, it does seem cruel," said the humble

moth; "but it is a good thing to be of some use in the world, even at the cost of one's life."

"And of what use, pray, will your dead babies be to any one?" asked Mrs. Papilio a little angrily.

"The fine threads of their cocoons will be woven into a piece of silk that will be fit for the robe of a queen. In fact," said the moth, "there is not a yard of silk any where in the world to-day, that was not made by some of my relatives."

"But what about the ribbons, satins, and the velvets?" asked the swallow-tail, looking down at her pointed, velvety wings as she spread them open in the sunshine.

"They are all of them our work, too," answered little Mrs. Bombyx, with some pride. "I have seen many fine silks and velvets that were much handsomer than your robes, madam, and all of them were far more lasting."

The swallow-tail was silent for a moment, and then she asked,

"But why cannot your babies come out of

the cocoons as you did, before the silk is taken off?"



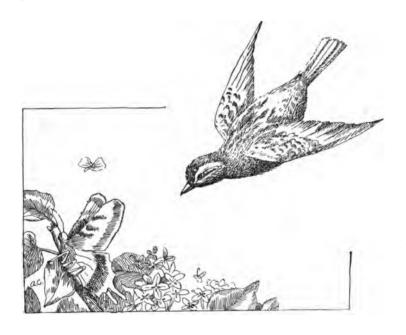
COCOON OF TUSSOCK SILKWORM.

"Because that would break the threads of the cocoon, which should be wound off in one long strand," answered Mrs. Bombyx, in a quiet tone.

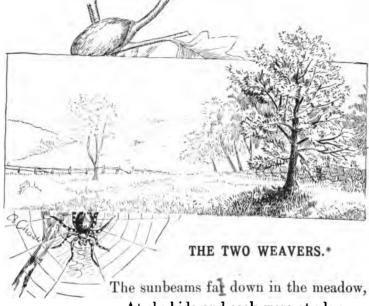
"Well," said her neighbor, shortly, "I would like to see anybody or anything cheat me out of my life just to make use—"

Here her remarks were cut off, for a chipping

sparrow just at that moment darted down and bore her away in his sharp beak, to another part of the garden.



"Ah," said the modest moth, as she looked after her, "it is well that I wear a faded gown; for it was Mrs. Papilio's fine clothes that brought her this ill luck, after all."



At sly hide and seek were at play,
When lo, a tall oak threw its shadow
And frightened the idlers away

And then as the shadow grew deeper,

Two weavers climbed up on a tree,

One wrought a web-palace of lace work

As dainty as dainty could be.

<sup>\*</sup> The teacher should place on the black-board, in syllabified form, all difficult words in this lesson.

The other built up a coarse fabric,
A rustic and rough hodden-gray,
And in this plain garment, close woven.
She hid herself meekly away.

The gossamer weaver tripped lightly
Across her frail net of soft lace,
Her eight bead-like eyes full of malice,
And full of deep cunning, her face.

And when the fine structure was finished,
Her keen eyes, fierce, scornful, and proud,
Peered slyly in quest of the toiler
Enwrapped in her self-woven shroud.

- "How dares that coarse weaver of home-spun,"
  She said, with a spiteful grimace,
  "Set up her rough loom near my palace,
  My palace of silver-spun lace?
- "Tis well the vile creature has hidden
  Her gross, ugly form from my sight;
  It may be the glare of my grandeur
  Has caused her to die of affright."

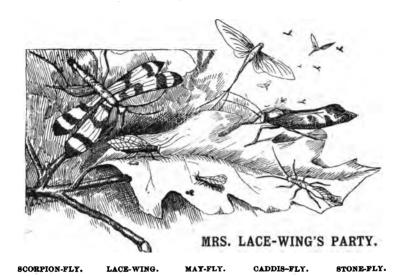
The sunbeams of summer departed,
And cold winds of autumn sighed low,
And soon her frail net-work of laces
Was buried in feathery snow.

But there, on the bough dried and leafless Unmindful of sunshine or cloud, Still lay through the long dreary winter, The weaver asleep in her shroud.

And when the oak donned her green leaflets
And birds sought her boughs on glad wing
And fair-petaled blossoms awakened
Beneath the warm kiss of the spring;

A creature of marvelous beauty
Burst forth from that gloomy gray shroud,
With pinions as swift as the sunbeams,
And bright as a golden-hued cloud.

But never more came the proud weaver
To build up her palace of lace;
Ah surely, "He scorneth the scorner,
And giveth the lowly his grace."



PART I.

r

Mrs. Lace-Wing said, from the very first, that she should invite no one to her party who did not belong to her set, and she was as good as her word.

There were about ten in all, and a very pleasant time they had of it.

After the dinner was over, one of the guests said, "Suppose we each of us tell the story of

our lives from our baby-days up to the present time."

"Good," said Mrs. Lace-Wing, "that will take the place of an after-dinner speech, and I am sure that we shall every one of us enjoy it; and to save time, so that all may have a chance to speak, I will tell my story first."

How handsome she looked as she lit at the head of the table!

Her bright green body was set off with four small gauzy wings, that gleamed with every color of the rainbow.

Now they shone like pearl; now they changed to a delicate blue, violet, or rose-color: and so, whichever way she turned, the beautiful wings flashed with a new light.

But the golden eyes! They were the greatest wonder of all. There was not a guest at her table that had such eyes as hers.

They glowed like drops of melted gold, and yet they were as clear as glass!

One would hardly have supposed, seeing little Mrs. Lace-Wing sitting there so sweet and lovely, that she could make herself very offensive if she chose to do so.



LACE-WING FLY, MANNER OF DEPOSITING EGGS.

And yet, had any one disturbed her at that time, she could have given out an odor, from a small scent bag which she carried with her, that would have driven every one of the company out of her presence!

When the guests had settled themselves, so that all was quiet about them, Mrs. Lace-Wing began.

- "My mother laid her eggs on the leaf of a fine cherry tree.
- "From the tip end of her body, she first dropped a thick, gummy fluid, and from this fluid she drew out a long, stiff, upright thread; and upon the end of the thread she fastened an egg.
- "There were as many as ten of these slender threads, each one of them bearing a small egg on the top; and the air soon hardened them, so that they stood up as stiff as a row of little pins."
- "What a very strange place for an egg!" said a little wingless Deathtick that had all this time been hidden by her neighbor's fine lace gown.
- "My mother was a very wise insect," replied Mrs. Lace-Wing; "and she had the best of reasons for placing her eggs on foot-stalks in that way, as I can prove to you.
  - "She knew that as soon as we were hatched,

we would be a very hungry family; and she knew, also, that if nothing better came in our way, we would soon fall upon and eat one another."

"Shocking!" cried several voices at once, in a very low undertone, for they were afraid of giving offence to Mrs. Lace-Wing, and then, what would happen?

"Just as soon as we came out of our shells we found our food ready for us on the cherry-leaf.

"And what do you think it was?



THE APHIS LION.

"A whole swarm of the sweetest little green plant-lice — just the thing that we each of us liked best.

"Now was not she a very wise mother to spread such a table as that for her little children?

"I assure you that we ate like hungry lions, and that is just what we were called; for the true name of a plant-louse is Aphis, and we bore the name of "Aphis lions" in our baby-days.

"We even went so far as to cover our bodies with the skins of the plant-lice, so as to hide away from our enemies.

"After a time we spun silken cocoons for ourselves, and finally came out of them happy little Lace-Wings, such as you see before you to-day."





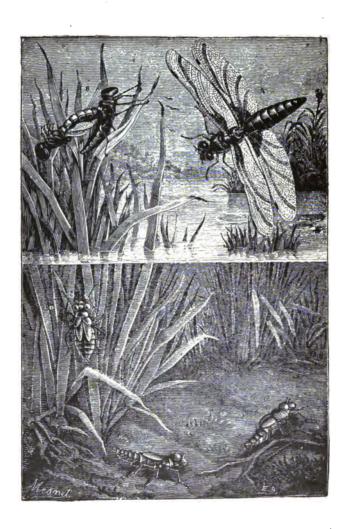
MRS, LACE-WING'S PARTY.

## PART II.

The Dragon-fly, who was placed at Mrs. Lace-Wing's right, was asked to speak next.

After glancing at the other guests with two immense compound eyes that went nearly round her head, and at the same time giving them a sly wink from three simple eyes on the top of her head, she began:

"You will none of you doubt my word, when I tell you that I was born near the bottom of a small pond; for I well remember of meeting some of you there when we were infants together.



"One day, my mother was flying over this pond, when she stopped for a moment, and lit upon the top of a green rush that was growing in the water, very near the shore.

"Then she dipped the lower part of her body down into the water, and laid a cluster of small, yellow eggs on a joint of the little green rush."

"But how could she make them stick?" asked several voices at once.

"Oh, she glued them fast, so fast that they could not fall off; and I am quite sure that there must have been at least one hundred of them.

"After some time had passed, a large number of water-babies came out of the eggs, and I was one of them.

"How funny we did look, with our six long, spider-like legs, and not the least sign of a wing-pad to be seen on any one of us!

"Then we began to eat greedily of everything that came in our way, such as small worms and the larvae of other insects.

"But the sweetest morsels of all were the tiny tadpoles, or 'polliwogs,' as you may have heard them called.

"I do assure you, my dear Mrs. Lace-wing, that not even those toothsome gnats and mosquitoes that I have eaten here to-day, can be compared to a large, juicy tadpole.

"And right here I must tell you that we had a very queer way of leaping about and seizing on such food as we liked best.

"At the end of our bodies, we each of us had a little tube through which we could spurt a stream of water to the distance of three inches behind us; and when the stream struck the water in our rear, we would at the same moment be pushed forward.

"So away we would go, and many a frolic did we have, chasing and catching our prey.

"But this tube served us a still better purpose; for it was really the breathing pipe that drew fresh air from the water and brought it to our little gills. "Of course," added the Dragon-fly, with a low, buzzing wheeze, "now that I am a perfect insect,



I breathe through the tube-openings on each side of my body; but when I was a baby, I had nothing better than very small gills."

"But how is it that you were able to feed on such large prey?" asked one of the company.

"My mouth was at that time nearly as large

as it is now," she replied, "and my under-lip was armed with two sharp hooks.

"But no one would suppose that I had such jaws at that age, for my under-lip served as a complete mask for the lower part of my face.



PUPA OF DRAGON FLY.

"So I used to lie in wait for my prey to come along; and when it was near enough, I would reach out this long mask-lip and draw the sweet morsel right into my mouth."

At this statement the Ant-lion, which had lighted at the foot of the table, folded her wings over her back, in the form of a steep roof, and just shook with silent laughter.

"After a time, I became a pupa, with small wing-pads," continued the Dragon-fly, "and then I darted about faster than ever; and though I could not use my pupa-wings at all, I often wished that I could fly.

"After that, I ate still more greedily than before; and one day I felt as if I should burst, and sure enough I did!

"I was climbing up the stem of a sweet-flag, when all at once, my pupa-case cracked wide open in the back, and what was I to do but to crawl out of it?

"I assure you that I was very proud when I found that I could unfold my little pads into four, broad, net-veined wings.

"How easily I sailed about everywhere; and pretty soon I went skimming far over the very pond in which I had spent all of my baby days.

"But I must confess that my brothers had much finer wings than mine, since theirs were banded, and flecked with many beautiful colors.

"Our family have been called by some very harsh names, as you know, such as Dragons, Mosquito-Hawks, and even Devil's darning-needles.

"But really, we are all of us very harmless creatures, feeding on nothing but other insects that are of no use in the world."

Here the Dragon-fly drew a long sigh through the breathing-pores of her slender body, waved her broad lace wings towards her next neighbor, and remarked that her story was finished.



## MRS. LACE-WING'S PARTY.

## PART III

A small Caddis-fly was the next one to speak. As she rose, she saluted the

company with her long thread-like antennae, and folding her wings over

her very short body, she said:-

"The only wonder is that I am here to tell my story!"

At this remark, a tiny White Ant with a chestnut-colored head, raised her delicate white wings and flew a trifle nearer as if afraid of losing a single word.

"Like my neighbor, the Dragon-fly," continued the Caddis, "I was a water baby.

"I fed on the green stems and plants that grew in the water about me; and sometimes when I was in pursuit of other baby larvæ smaller than myself, I would get a chance to snap up a fine water-flea.

"I ought to have said, that all this time I was hidden in a small tube-case that I had made for myself, of bits of stems, wood, sand, and little stones.

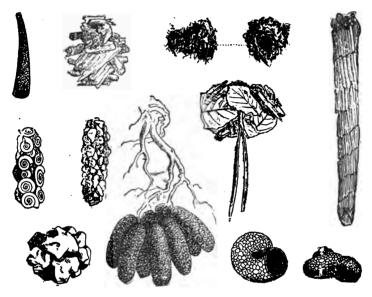
"This case I lined nicely with silk; and as I could put my head out at one end and my feet out at the other, I had no trouble in crawling about for food.



CASE, LARVA, AND FLY, OF CADDIS WORM.

"As soon as I was grown, I crept up the stem of a slender reed, and spun a silken net over the upper part of my tube-case, while I closed the lower end with a small stone; and then I went into the pupa state.

"When I awoke, I tore open the silken door of my tube, crept out of it, threw aside my pupa-skin, and crawled up out of the water, and as soon as my wings were dry, I began a new life."

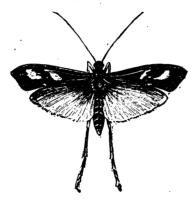


CADDIS CASES.

"But why is it such a wonder that you have lived to tell the tale?" asked a narrow-winged Scorpion-Fly, darting out a long, slender tube from the end of her body, and spitefully snapping a pair of sharp forceps that were fastened to it.

The Scorpion-fly always did this when she had any fears that there was danger ahead.

"Because," replied the Caddis, "I had so many enemies both in the water and out.

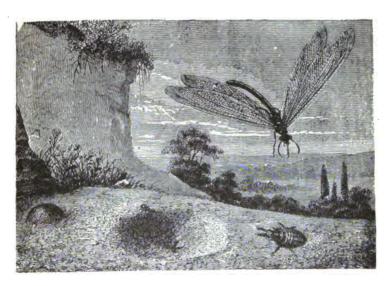


CADDIS-FLY.

"There were the Diving beetles always dipping down into the water in search of prey; and there were any number of hungry larval babies stronger than I; and worst of all, the fishermen along the shore were constantly hunting me for bait, and —"

"Just my case, exactly," broke in the Stone-fly, who up to this time, had been slowly fanning her long, flat body with her broad fore-wings. "I, too, was always hiding away under stones in the water when I was a baby, through fear that I should be hunted for bait."

As the little Caddis seemed to have no more to



THE COMMON ANT-LION.

say, the Ant-lion was called upon to give her history.

As she slowly closed and unclosed her netted wings, she looked enough like the Dragon-fly to be

her own sister; but as they are quite closely related, it is not strange, after all.

"I am glad to say," she began, "that I was not a water-baby, for I was hatched from an egg that my mother laid on the dry sand under the edge of a large rock.

"As soon as I came out of the egg I began to look for something to eat.

"I found that my legs were placed upon my body in such a way that I would have to walk backwards all through my baby days.

"So, as I could not run forward after my prey, I dug a sand-trap with my shovel-shaped head, and placed myself in the bottom of it.

"There I lay with my wide-open jaws, waiting for some insect to come along.

"I did not have to wait long, for very soon a busy little ant came upon the edge of the pit-fall; and in a moment, down she fell right into my hungry mouth.

"I gobbled her up in a second, and then I

waited for another. In a few minutes I spied one tumbling down, but she quickly turned about and began to climb towards the top.

"So I heaped up some sand on my shovel-head and threw it at her, and then down she came; and so I kept on till I had eaten my fill.

"As I sucked the juice from each one, I cast the skins aside. But I was too wise to leave them where other insects could peep down into my sandtrap and see them; for I well knew it would frighten them away.



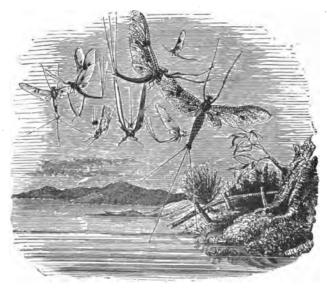
CIRCULAR DITCH OF ANT-LION.

"So I heaped them on my head, and giving it a quick toss, I threw them up out of the top and at some distance away from my pit-fall.

"After a few days I built a sand-cocoon, and lined it with soft silk.

"But I still kept my strong jaws and when I

was ready to leave the cocoon I cut the silken lining open, and made a small hole in the cocoon with my head.



MAY-FLIES.

"Then I crept out, leaving the silk lining also partly out of the sand-cradle in which I had passed my pupa sleep."

As the Ant-lion ceased speaking, a dusky-winged

May-fly rose in the air, and quickly darted out of sight.

"That would seem a little rude," said Mrs. Lace-wing, "if it were not for the fact that Mrs. May-fly has only about one day to live.

"She no doubt feels that her end is very near, and so she would hardly have time to tell the story of her baby-life."

At this remark the entire company rose with one accord, and bidding kind Mrs. Lace-wing good-day, they spread their wings and were soon lost to sight.

And now your teacher will pronounce for you the hard name of the Order\* to which Mrs. Lace-wing and her friends belong.

This long, hard word means vein-wing, because all the insects of this Order have the wings full of very fine veins, crossing one another like gauze, or lace.

<sup>\*</sup> Neu-rop'-te-ra.

They nearly all of them have wings, but there are a few, like the little Death-tick, that have none.

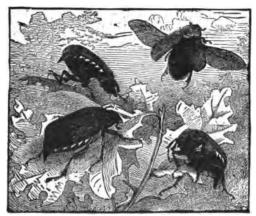


DEATH-TICK BEETLE.

This insect strikes its small head against wood or some other hard substance, and that makes a ticking sound; and there are some foolish people who believe that it fore-warns of a death in the house where it is found.

But we, who read and study the habits of insects, know that it makes this low sound in order to call its mate, which is never very far off.

Few, if any, of this Order of vein-wings, are harmful; and most of them are helpful; because they feed upon other insects that do a great deal of harm, both in the fields and gardens.



MAY BEETLES.

## FARMER BROWN'S ENEMIES.

It is a warm evening in the month of May. The lamps are already lighted and we have visitors.

"Who are they?" you ask.

Do you not see them flying about the room?

"Ah, they are only May bugs," you reply.

Let us catch one and examine it. If we look

closely we shall find that it is not a bug at all. It is a beetle.

"And what is the difference, pray?"

I will tell you.

The front portion of the fore-wings of all bugs are often tough and leathery; and the mouth-parts are formed into a sort of sucking-tube.



VARIOUS ANTENNAE.

And now let us take a look at our little brownclad visitor, and see what she is like.

Her horny outside wings shine as if they had just been polished. See how they cover and protect her thin, silken wings beneath.

She scarcely uses these stiff outside wings in flight. They are the sheaths or covers of the true wings.

It is on this account that Mrs. Beetle and all her friends are placed in an Order by themselves.

"What is the name of this Order\*?"

It is a long word to pronounce; and you can not learn to say it easily.

Your teacher will divide it into steps, and let her voice glide along a step at a time.

"What does it mean?"

It means sheath-wing, and so it is, as you see, just the right word to use, even though it may be too hard a word for you to speak.

Let us look at Mrs. Beetle's head. Like all insects, she has two large, compound eyes.

But you will see that her mouth is not at all like a sucking-tube. It has strong jaws for biting leaves, and other food. On the end of each short antennae, are three little leaflets or plates. All beetles do not have the antennae finished in this way.

And look at her light yellow, wooly vest; really, my lady comes out in style!

<sup>\*</sup>Co-le-op'-te-ra.

Her six legs are yellow too, but of a tawny cast, and the joints are black. She is not quite an inch long, and yet what a buzzing sound she can make!

But see, her mate has just flown out of the window, and we may as well let her follow him.

Later on in the evening, Mrs. May Beetle will give a large party in Farmer Brown's garden; but neither the farmer nor his wife will be invited.

There will be a great feast, made up of the tender leaves of the plum and cherry trees; and to-morrow morning, the farmer's fruit orchard will look as if it had been swept by a storm of hail.

"And what will farmer Brown do?"

He will spread a sheet under his trees, and shake the boughs very hard.

Then the beetles will come tumbling down; and having eaten such a hearty meal, they will be too sluggish to fly away. So he will gather them up by the pailful.

After he has emptied them into a kettle of boiling water, he will feed them to his chickens.

Then he will dust the branches and leaves of his trees with lime, to keep other beetles from visiting them.

"And what becomes of the beetles that escape?"

Sometime during mid-summer the females creep down into the ground and lay their eggs. Each female lays as many as fifty at a time. Soon after laying their eggs, they die.

In about a month, the egg hatches out a small white grub, having a reddish-brown head, and behold, what a family each mother has left behind!

And how hungry they are! Now the poor farmer has more enemies than before.

Corn, wheat, barley, potatoes, strawberry plants,—in fact, anything that farmer Brown likes best, they like best.

Once in a while, a whole army of them will cut their way through the earth, and leave the grassy sod so loose above them, that it can be rolled up like a piece of carpet. "But what do they do when cold weather comes on?"

As soon as frost begins to harden the ground they work their way down into the earth and go to sleep.

There they remain till the next spring, when they creep slowly upwards, and with hungry jaws begin to feed as before.

And thus they continue to eat and to sleep by turns for nearly three years; and then, on some hot day in June, they will build themselves an earthen cocoon and enter the pupa state. There they will remain till early in the fall, when they change into the form of a beetle.

But even then they seem not quite ready to fly; and so they lie in a half sleepy state till the next May.

Sometimes these beetles fly later in the season and are known as "June Bugs."

But no matter by what name they are called they are still beetles.

"How will the farmer get rid of these fat baby grubs that hide so far down in the earth?" you ask.

Sometimes he will scatter lime, salt, or ashes over the ground above them; and sometimes he will burn them out.

At another time, he will turn a drove of swine or a brood of chickens in upon them; or he will plough the ground very deep and destroy them.

And again,—he will make a very strong tea of burdock leaves and sprinkle it over his garden; and rather than eat such distasteful food, they will either starve or seek other quarters.

But you must know that this fat grub also has its enemies; and among them are birds, moles, weasels, bats, and many other animals.

There is an insect called the digger-wasp that burrows into the ground and lays an egg upon the soft skin of the baby beetle.

The little larva, that hatches out from this egg, feeds upon the poor victim till it causes its death.

But the queerest enemy of all is a tiny plant called a fungus.

It takes root between the head and the first joint of the little grub's body.

At first, it looks like a pair of long, green horns; but finally its color changes to brown. Sometimes it is three or four times as long as the body of the grub.

You can easily believe that the little creature cannot live long with a small green tree growing under its chin!

We will try to gather as many different kinds of insects as we can find; and in our search for them we shall be able to study their forms, colors, and habits, and we shall also be able to know to which Order they belong.

It is very easy to secure such as feed upon our field and garden plants; and of these, the potato "bug" is among the most harmful.

But farmer Brown has many enemies besides the beetles; and this you will soon find out if you watch the larval babies of the moths and caterpillars that are creeping about everywhere.

The larva of one kind of moth is known as the cut-worm; and it is quite as destructive as the hungry white-grub of the May beetle.

Now collect together as many different kinds of beetles as possible.

You will know them from other insects by their hard wing-covers.

Wet a piece of cotton in ether and drop it into the same bottle where you have placed your beetles.

After they are dead, we will draw the legs and the antennae into place.

Then we will run a very slender pin through the right wing-cover and fasten each beetle to a small card bearing its name; but very small beetles may be glued or gummed to the cards.

These we will add to our cabinet; but even then we must watch our specimens or they will be destroyed.

There is a small beetle that creeps into cabi-

nets and lays her eggs in the bodies of the dried insects.

These eggs hatch out grubs having thick bodies with long bristles; and they will soon destroy a specimen so that there will be nothing left of it but a shell.

So it is a good plan to examine our cabinet from month to month; and when we find particles of dust scattered about inside of it, here and there. we may know that a living beetle has been at work among the dead!

"What shall we do then?"

Wet some more cotton in the ether, put it into our cabinet and tightly close the door.

And this we must continue to do from day to day, till we are quite sure that the insect-pest is destroyed.

You will now see that we, too, have our enemies among the beetles, as well as farmer Brown.



ROVE BEETLES.

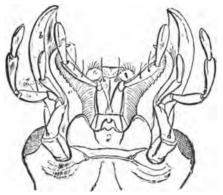
## SEEING THE WORLD.

# PART I.

Early one bright summer morning, a young Rove beetle crept out from under a piece of crumbling bark, and looked carefully about him.

He had a long, slender body with very short wingcovers. His head was quite large, and his strong, jointed antennae looked like small horns.

Pretty soon he began to run briskly about; and as he did so, his tail turned up like a bunch of bristles.



MOUTH OF A BEETLE.

Then he opened a pair of large jaws and began to feast on a dead mushroom near by.

As he moved about, here and there, his black body gave out a very disagreeable odor; and this could not be wondered at, eating and sleeping in such a filthy way as he did.

After he had finished his meal, he darted swiftly off toward a large stone, and crawled under it.

There he found a number of his friends, living in an ant's nest.

They seemed to be as contented and happy, staying there with the ants, as they would have been in a home of their own; and the busy little ants made them very welcome.

"I have come," said the Rove beetle, "to invite you to take a journey with me."

"Where are you going?" asked his friends.

"I am going to see something of the world," replied the Rover, "and I shall be greatly pleased if you will join me."

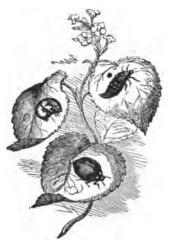
"You will have to excuse us," said his friends; "for we cannot go with you.

"We can see a great deal of the world under this large stone; and as we cannot fly, it is much safer to stay where we are."

"Just as you choose" answered the beetle, spreading his thin under-wings, and away he flew in search of other company.

He soon came upon a group of pretty little

"Lady-birds." These small beetles were clad in spotted gowns that were as smooth as satin.



LADY-BIRD AND ITS STAGES.

Some of them were red, trimmed with thirteen black spots; while others were of an orange yellow, having but nine spots; and there were still others, having but two spots.

"It will be impossible for us to go with you," they said, as soon as he had made known his errand.

"We are just getting ready to lay some little yellow eggs on the bark of this plum tree.

"The leaves of this tree are always covered with plant-lice; and as soon as our babies are hatched, their food will be ready for them."

"Never mind," said the Rove beetle "there are plenty that will be glad to go with me;" and he flew swiftly away again.

As he flitted lightly along, before he was really aware of it, he found himself in a very dark cave.

And there he discovered quite a number of beetles that were perfectly blind.

"Of what use would a journey round the world be to

us," they inquired, "since we have no eyes to see?"

BLIND BEETLE.

Our Rover did not wait to reply; for he feared that should he remain in that gloomy place very long, he, too, might lose the power of sight.

Soon after that, he lighted near a little Rose beetle, having a small light green head, and yellowish brown wing-covers.

Her antennae were quite short, but her legs were long and slender.

"Thank you," she said, in reply to his invitation, "but I prefer the crimson heart of this rose to a journey round the world."

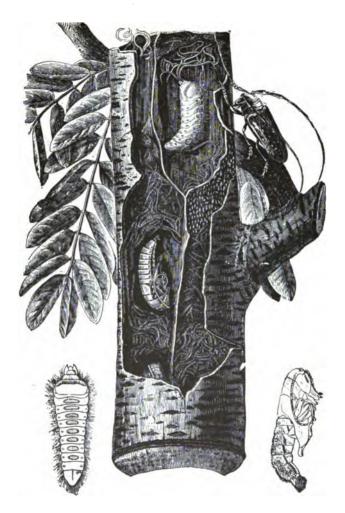
And with that she began chewing a delicate rose-petal, with her small, soft jaws, after which she sipped a few drops of nectar to wash down her meal.

Just about that time he observed a number of very large beetles that had gathered upon the trunk of a tall pine tree.

These insects proved to be what is known as the "Long Horns," and they are well named; for their stiff, curved antennae look very much like slender horns.

The females of this group were very busy, running about here and there upon the tree; and pretty soon, one of them gnawed a hole in the bark of the tree, and pushed into it a small egg.

Now the larvae of these "Long Horns" are called "borers," because they bore into the trees and remain there for a year or more.



THE LONG-HORN BEETLE.

Then they build a chip cradle at the end of their burrows, and there they sleep through the pupa state, with their heads toward the thin part of the bark which they use for concealing their holes.

These Long-horns and their larvae are a great pest among fruit and forest-trees; and the Rove beetle soon found that they were altogether too busy with their work on the tall, pine tree to join him in his rambles.





JUMPING ORGAN OF LEAPING BEETLE.

LEAPING BEETLE.

So he flew toward an open field in which he saw a number of Leaping beetles turning somer-sets.

No sooner did they fall down on their backs than they would double up the body and spring into the air again.

"Snapping beetles," said the Rover to himself.

"They are having a fine time of it; but when they were babies, they were nothing but Wire-worms; and many a time have I seen them cutting off the roots of grass, wheat, and other grains, in order to keep themselves from starving. But they can afford to play now for their time is short."

As he made this last remark, he spied a shining bronze beetle sunning himself on the fence.

His handsome wing-covers looked as if they had been finely carved; and both the body and wings had the color and the glow of bright, new copper.

It sometimes happens that cattle will eat this kind of beetle by mistake, which so poisons them, that they soon swell up and die.

Now, it is a trick of this insect, when disturbed by any one, to lie on its back, cross its legs, and pretend to be dead. And it was just in this plight that our Rover found him.

So he cried out "Here, turn yourself over, my friend and come along with me, I am going to see the world."

In a twinkling, the shining bronze cheat was up and away, without so much as easting a look behind him!

"What a sly fellow!" said the Rove beetle; "I knew very well that he was not dead."



SEXTON BEETLES.

# SEEING THE WORLD.

### PART II.

The next time that our young Rover halted, he observed some insects creeping over a dead mole.

They were black coats, banded with orange yellow; and upon the end of each antenna there was a small knob.

"Ah, they are Sexton beetles," said he; "they will dig a hole beneath that dead mole, and bury him under the ground.

"Then they will lay some eggs in his body; and when their babies are hatched out, what a feast will be spread out before them!

"It is of no use to ask them to go with me," and he journeyed on.

Pretty soon he was joined by an insect having a very large eye-spot on each side of the thorax.\*

"You look like an owl," said the Rover.

"Would you like to go along with me and see a little of the world with those great eyes of yours?"

"I am called the Owl beetle," she replied; "but these large, round spots that you see are not eyes at all, they are only beauty marks.

"But although I am not an owl, I am much too wise to waste my time in flying idly about with you."

<sup>\*</sup> The body of an insect is divided into three parts, namely: Head, Thorax, and Abdomen. See Book I.

And in a moment she darted out of sight.

As he looked after her he saw an immense creature flying directly towards him.

"I do believe that I am going to meet a giant," said he; "but I must be brave, if I am to travel clear round the world, all alone."

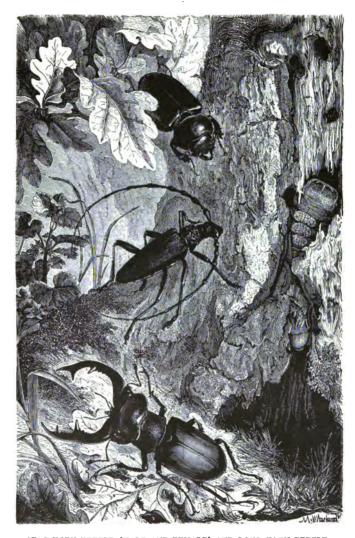
As the monster beetle came up, our Rover ventured to say, "Good morning, my friend, I am just flying about to see something of the world."

"And I can see by your looks that this is the first time that you have ever met with a male Stag beetle," said the other.

As he spoke, he opened a pair of such large jaws that the poor Rover greatly feared that his time had come.

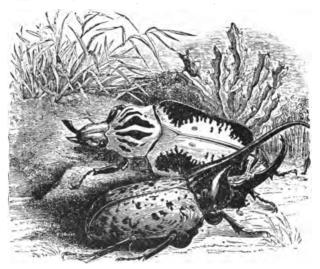
"And where is Mrs. Beetle?" he asked, trying to be very polite.

"She is on that tree yonder, and busy enough too, finding a place to lay her eggs in the crevice of the bark."



STAG-HORN BEETLE (MALE AND FEMALE) AND LONG-HORN BEETLE.

As the Rover looked, he was glad to see that she had no horns.



GOLIATH AND HERCULES BEETLES.

"You have nothing to fear from either of us," said the Stag-horn; "for we feed mostly on sweets and the juices of plants; so you can go on your way, and see as much of the world as you like."

Then calling after him, he added, "If you fly a little farther southward, you will meet with beetles much larger and stronger even than I am.

"In fact, they are such giants, that they go by the name of 'Samson and Goliath.'"

Our traveler thanked him very kindly, and then continued his journey.

As he was passing a pretty vine-clad cottage, he stopped to rest for a moment in a grape arbor in the garden.

And here he found a great gathering of fleabeetles.

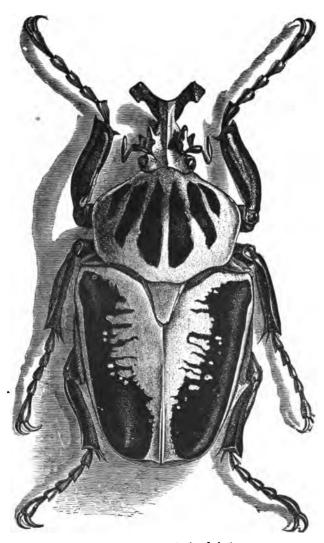
Some of them wore black coats, striped with yellow, others were clad in green, and a large number of them wore steel blue.

These last were running briskly about over the grape-vines.

Both beetles and larvae were at work enjoying a rich feast.

Just as our traveler was about to hail them, the grape vine was roughly shaken by an unseen hand, and down they fell in large numbers, right into a tub of boiling hot water.

"Bless me!" exclaimed the Rover, "what next?"



GOLIATH BEETLE (natural size)

and he flew away as fast as his wings could carry him.

After a while he came upon a modest little Glowworm.

"My pretty Fire-fly," said he, "would you like to take a turn round this great world with me?

"Your little lamp would be of great service to us both; for then we could travel by night, as well as by day."

"I would be very glad to do you the favor," she replied, "but I have so many cares that I really must stay at home and look after my duties here.

"I have a cousin in Europe," she continued, "who has no wings at all; and so she is even more of a 'home-body' than I.

"When she wants to lay her eggs, she places them in a bed of moss, or on some other low plant; and her babies feed on small land-snails.

"But it will soon be night, and I must be ready to light the way with my lamp;" and with that, away she flew.

Now whom should our traveler meet at the very next turn, but Mr. and Mrs. Tumble-bug?



SACRED BEETLES.

They were rolling along a large ball of dirt, in which Mrs. Tumble-bug had deposited her eggs.

Sometimes they would push it along, and sometimes they would drag it after them.

"I shall not ask them to go with me," said

the Rover; "for they will never leave that ball of dirt, till they have found a safe place for it.

"And I well know that there is something good inside of it too; so, when their babies are hatched, they will find their first meal all ready for them."

As he turned to look at the large Tumble-beetle again, he could see the broad, flat leaves of their club-shaped antennae open and shut like a small fist, as they rolled the heavy ball along its way.

But suddenly he stopped and looked straight ahead of him.

"Ah me! Here come the terrible giants, at last," he said; and sure enough, right in the path before him stood two immense beetles, a male and a female.

The male was armed with a strong, black horn, that curved from the top of his head, upward.

And from the upper part of the thorax there was another horn thrust out; and on each side of this, a short, sharp spine.

The body of the male beetle was over two inches in length, and that of the female was but a trifle less.

Their stiff, horny wing-covers were of a greenish gray, sprinkled with black dots.

Their stout, black legs were covered with strong spines; and at the end of each leg were two sharp, curved claws.

It is no wonder that the poor Rover trembled with fear; for these were giants, indeed.

And what a harsh, shrill noise they made! Not a sound could be heard in the midst of such a din as that.

And such an odor! Our Rover was well aware that his own body was not always agreeable as to its odor; but these creatures, oh! oh!!

He was just planning how best to make his escape, when the two giants turned aside and went striding off at a rapid rate toward a young ash tree that was growing near by.

They then began with their huge, cutting jaws to

plane off the outside of the young twigs, so that they could get at the inner bark.

There they greedily gnawed away, paying no attention whatever to the frightened Rover, who stole softly away, while his small, bristly tail actually quivered with fright.

Now the truth is, that had he not been so completely scared out of his wits, he would have seen that these Giant beetles cared for nothing but the leaves and the sap of those young ash trees, and that he was in no danger whatever.





TIGER BEETLES.

### SEEING THE WORLD.

#### PART III.

After our traveler was again well on the wing, and had time to think it all over, he said softly to himself, "I believe I never will be scared again till I am hurt."

Now as he was flying along, he chanced to look downward and there he saw a deep hole in the sand.

An ugly, hunch-back grub had crawled up one side of the hole, and lay near the top, with wide-open jaws.

"This is the baby of a handsome Tiger beetle," said the Rover. "It's mother wears a glossy green gown that shines like silver; and it is often trimmed with pretty dots and stripes.

"She is really very beautiful, but that hideous looking baby of hers, ugh!"

Not far from the sunny path-way over which our traveler was flying, there was a fine plum orchard.

As he glanced that way, he saw a large number of weevils very busily at work on the young fruit.

On flying a little nearer, he discovered that the females were making little holes in the skin of the plums with their sharp pointed snouts.

Into each hole an egg was laid; then Mrs. Plumweevil found her way to another branch.

And so each female kept on till all of her eggs were deposited. And what then?

After a time, there creeps from the green plum, a fat, footless white grub, having a small, brownish, round head. But the plum nearly always falls from the tree before the grub is hatched out.

Quite a number of these small green plum-cradles were already scattered about here and there, and as the weevils seemed to be very busy, our Rover sped on without so much as a passing salute.



BOMBARDIER BEETLE.

Just as he lighted on the ground, in order to rest his wings for a moment, he spied a little gun \* beetle under the edge of a small stone.

<sup>\*</sup>Bombardier beetle.

He crept a little nearer to the stone, and as he did so, he bold gunner discharged several drops of a sharp, stinging fluid from the tip of his pointed body.

"So you carry a pistol about with you," said our traveler, moving away at a safe distance from the enemy.

At this, there was another discharge, and then another, and still another.

"I am not at all afraid of you, sir," said the Rover; "since I have been able to pass both the giant Samson and his wife, unharmed, I have no cause for being afraid of you."

In reply, the angry gunner again discharged his musket; our Rover was by this time too far away to even hear the report of it.

He now directed his flight towards a beautiful flower garden.

Here he saw beetles flying about, dressed in the most brilliant colors.

Many of the soft, changing hues were so like

the delicate petals of the plants, that it would almost seem as if the flowers themselves had taken wings and were flying about.

Among these insects was an Oil beetle of a dark violet blue color.

Her head was much bent forward, and her neck was very small.

She had small slender legs, from the joints of which she would sometimes shed little drops of oil.

This oil was very offensive to our Rover; and besides he well knew that it would raise a blister on his body should he chance to touch it.

This beetle is a near relative of the Spanish-fly, which is not a fly at all, but a true beetle, and is often used in medicine for raising blisters.

"I do not care for such a companion as that, on my journey," said the Rover.

"And as the flower beetles do not choose to leave their fine garden, I will go on my way without them."

A little farther on was a large potato field, and

there he saw the Potato beetles very busily at work, while their handsome striped coats gleamed in the sunlight, as if they had been newly polished.

"They are despised, the world over," said the Rover, "and I do not care to be found in their company;" so he darted past, without even having been seen by them.

All at once he stopped suddenly in his flight.

Slowly creeping up the trunk of a tree were two of the most beautiful beetles that he had ever seen.

They had small heads, round bulging eyes and long, jointed antennae with curved feelers in front; while their forms were of the most graceful mold.

One of them was clad in jet black with three rows of golden dots on the wing-covers.

The other wore a light green coat, bordered with a very narrow edge of deep crimson.

The wing-covers of both shone like satin.

For a moment our traveler stopped and gazed in wonder; then he ventured to draw a little nearer.

At last he spoke. "My friends," said he, "I

am but a poor Rover, but I would be very glad to have you join me in a journey around the world."

"Oh, we are simply a couple of Caterpillar-Hunters," they replied, "and we are now on our way up this tall tree to look for a very choice kind, of which we are exceedingly fond."

At this the Rover seemed to be very much surprised.

"Caterpillar - Hunters!" said he. "I supposed that they must be the noted Diamond beetles of Brazil!

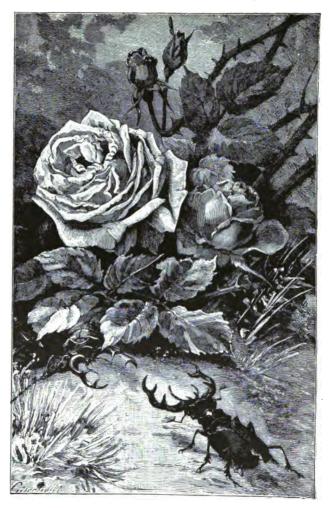
"Well, well, if they are so fond of caterpillars, they may not object to dining on a small beetle like myself," and he hurried on his way.



CATERPILLAR HUNTER.

The next insect that he met was a shining Goldsmith beetle.

His yellow wing-covers gleamed like real gold-leaf, and flashing here and there about the sides and top of the thorax was a changing hue of green.



IN THE GARDEN.

He was feeding on some tender young leaves, and when our traveler saluted him, he did not so much as look up from his feast.

"Stay at home then, old 'Gold-Beater,'" said the Rover angrily, "I can see the world without any of your help," and on he sped, faster than ever.

By this time he had reached the border of a small pond.

Here he saw a number of Diving beetles, both large and small.

They were dashing about in the wildest manner; some were flying up and down, and others were whirling around in circles, here and there.

Many of them were very beautiful,—almost as beautiful as the fine Caterpillar-Hunters that had charmed him so much.

"Halloo, my friend," cried he to one of them, "don't you want to come with me and learn something more about the world than you can see around this small sheet of water?"

"I cannot stop for a single moment," answered the Diver.



DIVING BEETLES.

"I am just getting my boat ready to sail to the bottom of this pond, where I am invited to dine with some young Water Tigers.

"We are to have a feast of worms, young

fishes, and half-grown tadpoles, a banquet which I am very fond of."

And with that he closed his hard wing-covers tightly over his body, and using his hind legs for paddles, he rowed himself down under the surface of the water, and in less than a minute he was lost to sight.



"Well, I never!" said the Rover, and then he looked at the place where the Diver went down, and slowly shook his head.

As he was about to fly away a group of Whirligig beetles gathered around him; and then they all began to talk at once.

"Do not waste a thought on that fellow," said one.

"He is a fine sailor and will soon come up again," said another.

"He was born in the bottom of this pond and was once a Water Tiger himself."

"Yes," chimed in a third, "and he is so fierce

and blood-thirsty even now, that he goes by the name of the 'Corsair,' which means a robber, and nothing better."

Upon hearing this, our traveler gave a sudden start, and bidding the group good-day, he quickly left them.

As it was now quite late in the afternoon, he flew to a tall tree at a short distance away, and crawling under a piece of decayed bark, he was soon fast asleep.

When he awoke the next morning, he found, to his surprise, that he had spent the night on the very same tree from which he had taken flight the day before!

As he crept slowly out from under the dry dead bark, he rubbed his eyes and said to himself, "I wonder if I really have been around the world or was it only a dream?"



Now he suddenly dives to the sub-marine caves Of his little marsh-ocean, and searches within For such booty as only this Corsair may win.

<sup>\*</sup> The teacher should syllabify the difficult words in this lesson.

Ah, a Corsair indeed! From his earliest days
What a savage career his life-record betrays!
For see! the young larva, with murd'rous intent,
Is already a pirate on fierce carnage bent.

With his horn-plated visor he seizes his prey And with ready-set fangs bears it swiftly away. Thus the poor hapless victim its life-blood must give That this infant marauder may flourish and live.

O thou antic young tad-pole, how sad is thy fate! Thou hast counted the days between thee and a state Of green, velvet-clad frog-ship, but counted in vain, For thy blood-thirsty captor regards not thy pain.

Thou wilt perish and die; he will fatten and thrive,
To expound the grand law that the fittest survive;
While thy finny companions, with big, bubbly eyes,
Gaze upon thee bewildered, in silent surprise
That a fierce Water-Tiger with bold sudden grip
Should cut off both thy hopes and thy tail at one snip!



BEES PREPARING TO MAKE HONEY.

#### REAL FAIRIES.

Come, let us go forth together and spend a little time in pursuit of the fairies.

It will keep us busy; for they are ever on the wing.

Here they come, humming and buzzing about the clover blossoms.

"What is the name of their queen?"

We will call her "Queen Apis."

"What does it mean?"

Apis means a bee; and now you all know that our fairy circle is made up of busy little honey-makers.

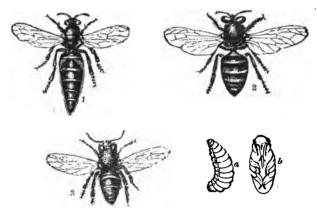
There is a very large number of them; but they all live together in peace; and each one does that portion of the work which has been planned for it.

This is the way they are divided: Queen, Workers, Drones.

The Queen is the mother of all; the drones are

the fathers; and the workers are the busy little children of the hive.

We will not say much about the drones; for they are lazy fellows, even too lazy to feed themselves



1. QUEEN BEE. 2. MALE BEE OR DRONE. 3. WORKER BEE
4. a, GRUB; b, FURTHER DEVELOPED PUPA.

# "What becomes of them?"

Sometimes the workers sting them to death, and sometimes they allow them to starve.

The poor drones cannot defend themselves, for they have no stings.

Now let us learn the history of the queen.

The cell of the queen bee is built on the edge of the comb, and it is much larger than that of the workers.

In every hive there are a large number of workers that act as nurses.

Now as soon as the queen bee is hatched from the egg, these little nurses feed her with royal jelly.

This jelly contains some pollen grains gathered from the flowers; but it is made up mostly of honey.

The little nurse bees eat it, and carefully prepare it in their own honey-stomachs; and then they spit it up into their mouths, and feed it to her Royal Highness, the Queen.

After she has fed on this royal jelly for five days, she refuses to eat.

Then the nurses put a cap of wax over her cell, and the royal larva spins for herself a delicate cocoon of silk.

The queen-baby rests in her silken blanket for about three days; for she is very tired with turning

her head this way and that, so many times while she was spinning it.

Then she enters the pupa state and has a good sound sleep; but at the end of the sixteenth day she comes out a queen.

"Now how does she look?"

She has a graceful form, as one might well expect of a queen.

Her body is longer than that of the drones, or the workers; but her wings are shorter.

Indeed she has but little use for wings, as she generally takes but few long flights.

A few days after she comes forth as a queen, she takes a flight in the air; and, when she leads forth a swarm from the hive she uses her wings again.

But she is a very quiet home-body, and busies herself only in laying eggs in the comb-cells which the workers prepare for her.

Sometimes she will lay as many as three thousand eggs in one day.

She likes to have these cells all clean and ready

for her; so she peeps into each one before she deposits any eggs.

When she is hungry, the workers feed her; for her mouth-parts are soft and weak and she cannot well feed herself.

The queen bee has a sting, but she seldom uses it; if you hold her in your hand and pinch her quite hard, she will not sting you; this sting is slightly curved.

I will tell you when she likes to use her sting; it is when she hears the piping sound of a young queen, that is ready to come forth from her cocoon.

Then she says to herself, "I am queen of this hive, and I will sting that baby-queen to death if she comes where I am."

But pretty soon she holds a counsel with all the wise subjects in her realm; and they decide that there are too many bees for one queen to look after; so she takes a large number of them and flies away.

I have no doubt but that the new queen is very proud; but even she has her trials, as you will see.

Perhaps she is no sooner hailed as queen, thanshe also hears a piping sound from another royal cell.

"What is that?" she says, "Am I not queen of this hive? I will fight for my throne before I will give it up."

And fight she does. Sometimes the other queen is the stronger and wins the battle; then alas, for our first new queen!

But no matter which gains the day, the victor resolves at once that there will be no more fighting for the queenship. So she flies quickly to all the royal cells, and soon makes short work of the little queen-babies that are almost ready to come out.

"But how about the old queen that went away with the swarm? They did not go so very far after all. Do you not see them all clustered together on that old apple-tree?"

Yes, but they are waiting for their queen to rest. Her wings tire easily, and she cannot fly very far at one time.

"Suppose they should lose her on the way?"

Then they would all come trooping back to the hive; for they cannot work without a queen.

"And now that the new queen has stung all the others to death, what would happen to the hive if she should die?"

The little nurses would feed a worker grub with royal jelly; and it would be given a larger cell, so as to allow it a chance to grow to its full size.

Then after a time this plain worker larva would spin her cocoon, and from this, she would fly forth a proud queen, quite as proud as if she had not been made queen by mere chance.

But even queens must die, and the longest life of a queen bee is not over five years; and most of them do not live even half of that time.

If by chance a swarm become so scattered that the queen is queen no more, her subjects pay no attention to her; and she may wander off and starve, for all they care about it.

This seems rather heartless; but people who have watched bees very carefully, say that it is true.

#### A BUSY FAIRY-WORKER.

Buzz-buzz-buzz!

All day long, outside my window, a small, brown fairy has been humming her little tune.

Close under the window is a little mound, fringed about with bright red blossoms, and in the centre of it is a bed of blue violets.

It is plain that our fairy bee likes the color of the blue flowers best; for she does not go near the red ones at all. Her sense of smell is quite keen, too, and the breath of the blue flowers is very sweet.

Let her lap the nectar then, with her sheathed, hairy tongue, from their scented petals; and while she works she can enjoy the pretty color, and the faint odor of the flowers at the same time.

She is such a faithful little body that she must surely be entitled to some pleasure with all her toil.

But it may be that she finds the purest nectar in the flowers of her favorite color,—who knows?

Our little brown worker is not a greedy fairy, by any means.



BEE (under surface, showing wax.)

"Then what becomes of all the sweets that she laps up with her slender tongue?"

Would you believe it? She has three little stomach-sacs in her small body,—yes, and besides all these, there is, in one of the sacs, a mite of a strainer, made of fine hairs!

For no matter how clear the nectar may be,

there are always a few atoms of pollen mixed with it; so she uses her little strainer to sift them out.

First, the food that she gathers passes from her mouth-parts, down her slender throat, into the sucking stomach, or crop.

From this, it goes into the stomach-mouth, where it is strained; and afterwards it finds its way into the true stomach.

When next you take a drop of honey, perhaps you will stop to think how much pains the little brown fairy took to make it clear and sweet!

But she retains only a very small portion of all this, for herself; for workers feed mostly on bee-bread, and that is made chiefly of pollen grains.

After she has changed the nectar in her stomach to clear honey, she draws it up into her mouth again, and deposits it in the cells of the comb that have been set aside for that purpose.

Some cells are for honey, some for pollen, and some for the eggs of the queen; but it often

happens that both honey and pollen are found in the same cell.

When our fairy worker was a larval baby, she was fed by the nurses on bee-bread, that they carefully softened and prepared for her with their own mouths.

She did not feed on the rich bee-milk that was given to the baby queen!

Oh, no,—that was too good for a common workbee larva.

Now behold her small, hairy body! It is so covered with pollen dust that she looks as if she had been sprinkled with yellow snuff.

But she has gathered it for a purpose, and she will not waste a single grain.

See her draw her antennæ, first one, and then the other, through the two small hair-brushes of her fore-legs.

These brushes are her antennæ-cleaners, and do they not perform their work well?

Next, these small brushes are passed through the

stout, hair-toothed combs of her middle legs; and then, with the stiff, golden-colored combs of her hind-legs, the entire pollen mass is gathered up and packed in her pollen baskets.

"And where are they?"

Between the two joints of each hind leg there is a shallow cavity, guarded by stiff, coarse hairs.

These are the baskets in which the bee stores her pollen till she can return to the hive and place it in the cells.

But this is not all; for our little fairy still has eight small wax pockets hidden just underneath her abdomen.

And in addition to all this, she collects a kind of glue from the gum of trees, as well as from their tender buds.

This she uses as a cement for the comb, and also to fill up rough places and cracks about the hives; for bees are very neat little house-keepers.

When a snail creeps into the hive, the bees will first try their stings; this drives it back into its shell.

Then, with their sticky bee-glue they will seal up the door of the snail's shell; so there is poor Mrs. Snail a prisoner in her own house; and there is nothing left for her to do, but to starve!

So you see our little bee has quite a number of family stores to carry about with her.

"But the wax, where does that come from?"

It is made of the food that she eats; some of her food forms oil for her fat glands, just as some of the food that we eat, forms fat for our bodies.

This oil hardens and becomes waxy, and separates into very thin scales.

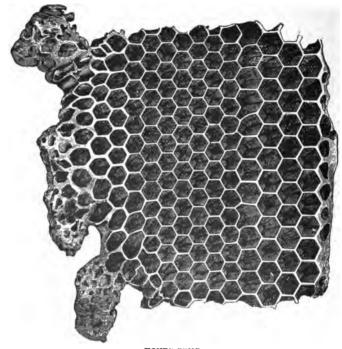
"Well, well! Three stomach-sacs, two pollen baskets, eight wax-pockets, and a place for her bee-glue besides?"

"How can one small bee carry so much at a time?"

Oh, her four, very thin wings are strong, and she can fly at a rapid rate.

In each of the pockets is a thin scale of wax; and these scales are loosened by the hairy joints of the hind legs.

These hairy joints are sometimes called "jaws;" and they really do act like a pair of jaws; for they



HONEY-COMB.

scrape off the wax-scales and carry them to the claws of the fore-legs.; and the claws of the fore-legs convey each thin scale to the mouth, in which the bee works and softens it with warm spittle.

After she has softened it well, she draws it from her mouth in long, white ribbons, and with these ribbons she forms her crisp, white honey-comb.

If by chance a few grains of pollen are mixed with the wax, then the comb is yellow.

It would take a boy or a girl, a long time to copy one of these little cells in wax; and then it would not be as perfect as the cell of our little brown worker.

For what is more beautiful than the six-sided cells of the snowy honey-comb?

It is well that these busy little creatures improve "each shining hour;" for their lives are very short.

A bee may live eight or nine months; but she is more apt to die within two months after she comes from her cocoon; yet she is not missed from the hive; for new broods are being hatched all through the working season.

In the winter, bees do not work; they take a long rest, so as to be ready to visit the flowers in spring.

They are so drowsy all through their long winter rest that they eat but little food.

Now, little brown fairy, good-bye. We would be glad to hold you in our hands and make friends with you.

But you watch us very closely with your great compound eyes; and you peer at us with your simple eyes; and you buzz, buzz in such a cross tone when we come too near you, that we are just a little bit afraid of your sharp sting.

And should you sting us, you would more than likely leave your seven-barbed sting in our flesh. And then what? You would surely die.\*

<sup>\*</sup>Bees do not lese their stings when they wound other bees; because they run the sting into the soft part of the enemy's abdomen, between the rings.



### SOME CURIOUS BEES.



Did you ever see a Cuckoo Bee?

Like some Cuckoo birds, she
builds no nest of her own.

"Is she not a thief, then?" you ask.

I cannot say that she deserves

a much better name.

She is often seen flying about flowers. I will tell you how she looks; and then you will know her when you see her.

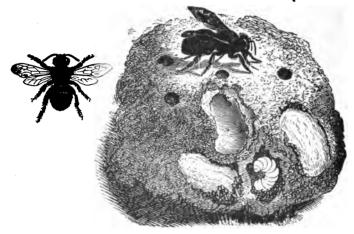
She has four, small, thin wings; and her body is slender and gaily colored.

If she flies very near your face, you will smell a pleasant, balmy odor, as if her pretty wings were so many sweet scented fans.

Now I will tell you something about this idle nest-thief.

One day I saw a small Mason Bee making her nest in a sunny bank.

She wore a smooth, shining coat of bluish green, which did not seem to be at all stained by the earth in which she worked.



THE MASON BEE.

She soon made for herself a neat little cell; and in this, she laid some very small eggs, and stored the cell with pollen.

Now all the time that she was busy about her cell, a shining Cuckoo bee kept darting around, trying to get a chance to lay her eggs in the same nest. But our little Mason was too quick for her, and closed up the cell before she could steal her chance.

At another time I saw a Cuckoo bee flying about in circles very low toward the ground.

I soon came upon a little Mason that had laid a piece of soft mud between two tufts of grass; this had drawn the Cuckoo that way.

The bee had gnawed quite a deep hole in the mud with her jaws; and in doing this, she had made the hole quite smooth inside. This was her cell.

How the thievish Cuckoo did dart about, trying to secure the neat little room for her eggs!

· But the careful Mason had already put in plenty of rich yellow pollen for the babies to live on; and after she had laid her eggs, she hid them securely with an earthen cover, which she had also made for the cell.

But, finally, one day, after digging up the ground with a spade, I found at last the opening of a small burrow.

Scarcely five minutes had passed, when a gaycolored Cuckoo bee came up out of the hole!

Then I knew that she had been stealing the nest of some hard-working Mason, and that her babies, when hatched, would feed on the pollen which the Mason bee had stored up for her own family.

Now what do you think? Are we wrong in calling her a thief?

"But do these little housekeepers that live all alone by themselves, finally go away, and leave their babies to get out of their earthen cradles without help?"

Oh, yes; for when the baby is ready to throw off its pupa-blanket, it moistens its hard shell with spittle; this soon makes it so soft, that the baby can punch a hole in it with its head; and then out it creeps and is soon ready to try its wings.

Some of the neat little housekeepers line their cells with the bright petals of flowers.

Although they live in a cellar, cold and dark, they want to make it look as pretty as it can!

But there are carpenters as well as masons among the bees.

Can you imagine an insect boring a long tunnel in solid wood?



THE CARPENTER BEE.

This is what the Carpenter bee can do.

She bores right against the grain at first, till she has made the length of her own body.

This burrow, I suppose, is her "front hall;"

from the end of this, she bores roadways in other directions.

Then she scrapes the wood very fine, much finer than sawdust; and, wetting it up with some sticky fluid from her mouth, she makes small cells along the roadways for her eggs.

So you see she is a real carpenter, although she never learned the trade!

There is another little bee that likes to live all alone by herself.

She is called the Leaf-Cutter, and this name fits her well; for her jaws are as sharp as scissors.

Her head is square, and her body is stout; and with her sharp little scissors she is able to carry on her household matters without any help.

At the end of her abdomen, upon the under side, there is a thick tuft of hairs; and this is the pollen basket.

Sometimes she makes leaf-cells in the stems of plants.

She can soon cut a leaf into very small bits,



"THE BUSY BEES."

and these she carries to the nest, with her hind legs. But she likes a large house, and so she makes about thirty cells in her nest.

It takes her at least twenty days to do this; then she stores them with pollen and lays her eggs.

When she cannot find a plant-stem, or a deep hole in a tree, she makes both her nest and her cells of leaves.

I am quite sure that the Mason, the Carpenter, and the Leaf-cutters must hold the idle Cuckoo bees in great contempt.

Honey-makers that live in the forest are known as Wild bees.

Sometimes when hive-bees swarm, a large number of them will escape to the woods.

There they soon find an old hollow tree which they use as a hive.

But they are not always safe, even in such a hidden place as that.

For some day a wood-chopper will come along, and seeing a little bee busily at work gathering sweets, or pollen from the wild-wood flowers, he will say to himself, "There is a bee-tree not far away."

Then he watches or "lines" the bee, as he calls it, and very soon he sees her dart into the hollow tree.

The poor little insect has betrayed herself and her friends, and now she must pay the penalty!

The strong wood-chopper cuts down the tree, and soon robs the colony of their hard-earned stores.

"But do they not fight, and try to sting him when the tree falls?"

Yes, but he is prepared for that. He wraps up his face in a veil, and wears thick gloves on his hands.

Then he builds a fire and smokes his fierce little enemies to death, after which he carries home his prize.

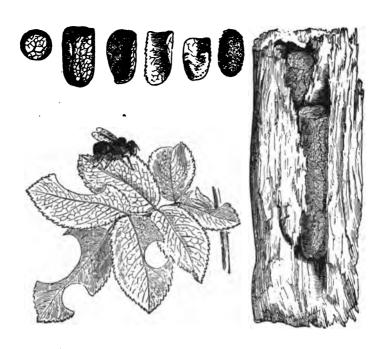
Humble bees, or "Bumble bees" as they are more often called, have some curious ways of building their homes and store-houses.

When the queen-bee awakes in the spring from her long winter's sleep, she begins to look about for a place to build her house.



"BUMBLE BEES."

Soon she finds the nest of a field-mouse, or something quite as good, that is no longer used by its first inmates.





THE UPHOLSTERER, OR LEAF CUTTER BEE.

And sometimes she builds a new nest for herself under an old stump or log.

Then she places in her nest a mixture of honey and pollen, and in this she soon lays a number of eggs.

When her babies are hatched they begin to eat the pollen mass, and as they push about, this way and that, they form cell-like cavities, in which they lie, when they enter the pupa state.

So you will see that they make their cradles of the food they eat!

After they have spun a thin, silken wall about themselves, the work-bees make it stronger by adding to it a thin layer of wax.

After a time, they cut their way out. Some of them are workers, some are small females, some are drones, and others are queens.

You will no doubt find many of these curious bees, if you look for them in the woods and fields.

## NOT QUITE SO SAFE, AFTER ALL.



EUROPEAN WASP AND NEST.

One day, a stout "Horntail" lighted on the trunk of a tall elm tree, and as soon as she had quietly settled herself, she began to bore a hole in the bark.

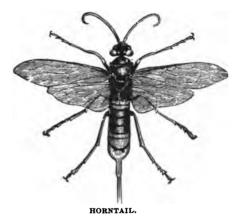
From the tip end of her abdomen, she drew forth a sharp auger that was hidden in a sheath.

As soon as she had made a hole in the bark, she worked her auger through into the wood of the tree to the depth of half an inch, or more.

Into this hole she

dropped a tiny egg that was somewhat oval in form,

and pointed at both ends. To make herself very sure that the egg should reach the right place, she guided it along its way by means of her long sheath.



This sheath of the female Horntail is divided into halves, and each half acts as a long finger in holding and placing her eggs.

After resting for a moment, she bored another hole, and then another, and still another, till at last all of her eggs were safely laid away in the tree.

"There!" said she, when her work was done, "as soon as my babies are out of the shell, there will be nothing to keep them from growing fat on the sap-wood of this tree.

"With their sharp jaws they will gnaw their way through and through the trunk and, when they have eaten enough, they will make for themselves a strong cocoon, woven of fine chips and silk.

"But the best part of it all is that they will be so *very* safe sleeping here soundly all through the pupa state in their snug quarters.

"And when they finally break open their strong cradle and gnaw through the bark of the tree, what a surprise it will be to the world to see so many handsome Horntails all coming out,

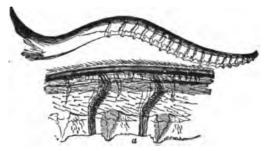
at about the same time!

"Now I have seen my neighbor, the Saw-fly," she continued, "make several gashes in a green leaf, with her sharp saw, and into each gash she dropped a small egg.

BORING SAW-FLY.

"That may be all well enough, but it does not seem to me to be quite safe.

"It is true that the gash will soon make a swelling in the leaf; and her babies will be rocked in a gall-nut cradle; and the sap which gathers there will supply them with food; and they will spin a very strong cocoon for themselves.



SAW OF SAW-FLY.

"But for all that, see how exposed they must be to storms and wind and enemies of various kinds.

"In fact, I have been told that Mrs. Saw-fly has a cousin in Australia that sits on her eggs; and even broods over her young larvae as a hen broods her chickens.

"Now what a care that must be; for my part, I want no safer place than the inside of a tall, green tree, like this." Now it happened that a little later on, there flew another strange borer into the same tree.



ICHNEUMON-FLY.

The name of this insect is very hard to speak;\* but it neans "The Tracker," because it can so readily track insects to their hiding places.

<sup>\*</sup>Ichneumon-fly.

This one carried an auger that was, at least, four inches in length.

She had scarcely settled her wings, when she thrust her long, slender auger into the bark and pushed it clear through, far into the tree.

But alas! When she tried to draw it out, it stuck fast in the wood.

For a long time she wriggled and pulled, but, all in vain, and she soon gave up her efforts, and so died, a self-made prisoner.

A few days afterwards an insect of the same kind lighted on the trunk of the elm.

"Ah," she said to herself, "this poor thing bored too far into the wood; but I will be more careful."

So, by first one hard thrust, and then another, she bored, not only into the tree, but actually into the soft skin of one of Mrs. Horntail's babies!

"So I have found you at last," she said; and then she placed an egg under the skin of the helpless larva.

Afterwards she bored a number of holes in the

tree, here and there; and every time she placed an egg in the body of a Horntail larva.

"There!" said she at last; "When my young ones are hatched out, they will each one of them have a fine, fat grub to feed on.

"And what safer place can there be," she added, "than the body of a baby Horntail, that is itself safely hidden away in the trunk of a tall tree like this?"

Now strange to say, not many days passed by, when another visitor came to this very same tree.

But this time it was a gaily dressed Wood-pecker.

On his head was a tuft of bright crimson feathers; and his plump red breast was set off with golden yellow wings.

With the sharp claws of his strong feet, he clung to the bark of the tree; while the ten, stiff feathers of his tail stuck straight up in the air.

Pretty soon he rapped with his long beak.

"Are you within?" he seemed to say, as he stopped for a moment to listen at the door.



Then he thought he would open the door for himself; so he made a small hole with his bill and darted in his slender tongue.

Now the Wood-pecker's tongue is very much longer than his beak, and toward the end, it is armed with horny barbs that point backwards.

In a moment he withdrew his long tongue from the hole, and what do you suppose it brought out? Nothing more or less than the larval skin of a baby Horntail, having inside of it the fat grub-baby of Mrs. Tracker!

How the greedy Wood-pecker did feast; for he never stopped till he had rapped at all the little doors about the tree.

And every time, too, he drew a helpless inmate out, and devoured it.

And so poor Mrs. Horntail's family did not have a chance to come out all at once in their new clothes, to surprise the world after all.







GALL FLY.

#### TIT FOR TAT.

- "Halloo, friend Mud-dauber!" cried a stout Baldfaced hornet\* to a slender mud wasp.
- "Halloo, I say, what are you doing with that fat caterpillar?"
- "I have just pierced it with my sting, so that it cannot crawl away," replied the wasp, "and now I shall place it in one of the mud cells of my nest."
  - "And what then?" inquired the other.
- "I shall lay an egg in its body, and when my hungry baby is hatched out, there will be a nice, squirming caterpillar to feed upon."
- "Have you any other stores in your nest?" asked the hornet.
- "Oh, yes," replied the wasp proudly. "I have in one cell a small white grub, in another a large wood-spider, and this caterpillar will make—"
- "A good meal for my little ones," said the

  \*The color of this wasp is a dark brown, but its face is white.

hornet, and with that, she snatched it up, and darted away with it.

Now the Bald-faced hornet does not live a solitary life, like the mud wasp; neither does she build her light, paper house without help.

In the fall, the males and workers in the hornet family perish; and if there are any larval babies in the nest, the hornets destroy them.

This may seem cruel, but it is really more kind to sting them to death, than it would be to leave them in the nest to starve.

A very few of the females live through the winter; and although they are queens they do not fight.

After all the others are dead, each queen-hornet seeks some safe place for the winter, and falls into a half-sleepy state till the return of spring.

In the spring, each queen begins to build a nest for herself.

At first it is very small, and is made almost entirely of fine threads of silk that she spins from the glands of her own body. She fastens it to a strong twig or branch of a tree, and in the first cell that is made, she deposits an egg.

As soon as a hungry baby comes out of the shell, she feeds it with a nice grub, or some other insect that she has caught; or maybe she will put a bit of ripe fruit in its mouth.

But the mouth-parts of the baby are weak and tender; so she softens the food with her own hard jaws, and then feeds her baby from her mouth as a parent bird feeds its young.

The larval baby spins its own cocoon, and as soon as it comes out of the pupa-case, it spreads its wings, so that they can dry, and flies about to help its mother, as a good child should.

Pretty soon the queen-mother has a large family about her. But the house is too small, it needs more room, and the children go to work and help her to make it larger.

With their strong jaws, they gnaw off bits of wood, and chew them to a fine pulp.

This pulp they spread out into thin sheets; and afterwards they smooth and pat them with their flat feet.

Then they place one sheet upon another, and glue them fast together, so they will become thick and strong, and water-proof.

They fasten the nest still more securely to the branch, and fill it inside with paper comb.

In every cell, an egg is laid by the queen mother, and as soon as one baby-hornet creeps out of its little paper bedroom, the cell is cleaned out, and an egg is dropped into its place.

The first broods of hornets are workers, the second are males, and the third, females or queens.

The cells of the comb are so placed that they open downward; and we might suppose that both the eggs and the larva would tumble out.

But not so; for they are glued fast; and very soon the head and front part of each larval baby becomes so much swollen that it more than fills the small door of its cell.

The queen-mother and the workers are always bringing home something nice, in the way of grubs and insects for the hungry babies.

But they eat nothing, themselves, but the nectar of flowers, the juice of fruits, and once in a while they suck the blood from the body of a honey-bee or some other insect that gathers sweets.

They lay up no winter stores in their cells; for they seem to know that it will not be needed.

And now we will return to our Bald-faced hornet and see what she did with her plunder.

She flew quickly, on her strong, swift wings, to her gray paper nest; and after making a good, large, soft mouthful of the caterpillar, she went from cell to cell, and putting her mouth close to that of each large headed baby, she dropped a small bit into its jaws.

"There," said she, "that will do for a beginning; now I must fly away and hunt for something more."

She soon came upon a small wasp that was

making her cell in an old rotten post; this cell she was gnawing out with her jaws.

As soon as it was deep enough, she flew away; and the Bald-faced hornet waited for her to come back.

She did not have to wait long; for in a few minutes the little wood-wasp returned with a buzzing blue-bottle fly, held fast between her fore-legs.

As she was about to push it into her burrow, our Bald-faced hornet snatched it from her with such sudden force that the poor wasp fell headlong to the ground.

The fine blue-bottle was soon crushed, and divided among her baby hornets; and then she started out in search of more.

She next spied a large, rust-red wasp covered with golden hair. Her thin wings were of a smoky hue; and her waist was as slender as a small needle.

She was making her burrow in a grassy bank, and the hornet stopped to watch her as she worked. How steadily and how hard she was digging! With her strong, sharp jaws she bored away into the ground, for a distance of six inches.



THE SAND WASP.

As she loosened the earth, she threw it out of the hole with her fore-feet; then she walked backwards for a little space, and kicked the dirt away from the mouth of the hole with her hind-legs.

If she came to a small stone, she pushed it

aside with her head; and sometimes she would even drag it out of the hole with her teeth.

Now the name of this sand-digger is "Sphex," a word that signifies wasp.

That is why the Bald-faced thief cried out to her, "I say, Mistress Sphex, how long before that sand burrow of yours will be done?"

"In about half an hour," replied the sand-digger, without looking up.

"And what will you store it with?" asked the hornet.

"Flies, spiders, and other insects," answered the sand-wasp, "but why do you ask?"

"I have not time to talk with you now," answered the hornet, "but I will come back again when you are laying in your provisions."

"May be you will not find them," said the sand-wasp softly to herself, "for I shall see that they are covered up with gravel."

As the hornet was flying along, she met a little brown honey-bee that was so loaded down with pollen, she could scarcely use her wings.

In an instant, and without a word of warning, she pounced upon the poor bee, and tearing off her head and wings, she began to suck her blood.

Just at that moment a giant Robber-fly came buzzing along, and grasping the hornet by her head, with its front legs and stout beak, it held her fast.

She fiercely ran out her sharp sting again and again; but it was of no use.

The Robber-fly knew just how to handle such prey as the hornet; and in a few minutes she ceased to struggle; for her strong captor had sucked her body dry of all its juices.

So at last the Bald-faced hornet had found her match; and whether she would or not, she was forced to play her final part in the game called "Tit for Tat."

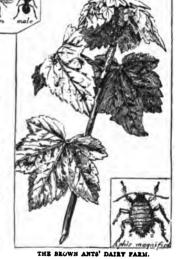
# SOMETHING MORE ABOUT FAIRIES.

I am sitting in rehow ADL.

the shade of an old apple-tree, this sunny afternoon. The fields Brown ADL are white with daisies, and the yellow buttercups have on their finest suits.

On a broad, green leaf, at the foot of the tree, a hundred or more little fairies are running briskly about.

There is not a wrinkle nor a fold in the shining



coats that clothe their graceful forms; and their waists are like a slender thread.

As I watch them closely, I can see what they are doing.

Here comes a neat little milk-maid; but as she

trips lightly along over the surface of the leaf, I do not see that she carries either a milking-pail or a stool.

Now she stops quickly, and seems to be patting and coaxing a little green cow.

This very small cow has a round form, a sucking snout, six slender legs, and a pair of jointed horns that are much longer than the body.

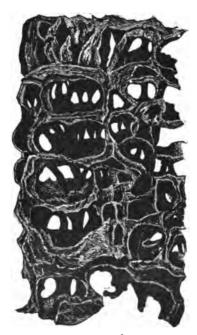
Pretty soon, from two small tubes near the end of her body, there slowly falls a drop of fluid that looks like honey. This must be milk; for the eager milk-maid quickly laps it up with her mite of a tongue.

Then she coaxes for another drop, and pats the cow again and again, until drop after drop is given out; and as fast as it falls it is lapped up.

I look about me and behold hundreds of other little milk-maids doing the same thing.

And now the sky begins to darken, and I hear loud peals of thunder, not far away.

But I will not leave my seat under the old apple tree; for its broad, leafy arms will shelter me, even if the rain-drops do fall thick and fast upon the ground. But what is the matter with the little fairies? for they are all of them scampering away!



SECTION OF ANTS' NEST.

Their small green cows, too, have hidden themselves in the cracks and holes of the tree.

"We must run home, as quick as ever we can!" I hear one of the fairies whisper.

"If we do not, our babies will be wet to the skin," cries another.

"Well, well!" This is fairyland indeed; but what does it all mean? I will tell you.

These fairies are little worker ants, and they are own cousins of the bees and wasps.

They have no wings; but their queen and the males of the nest can fly about.

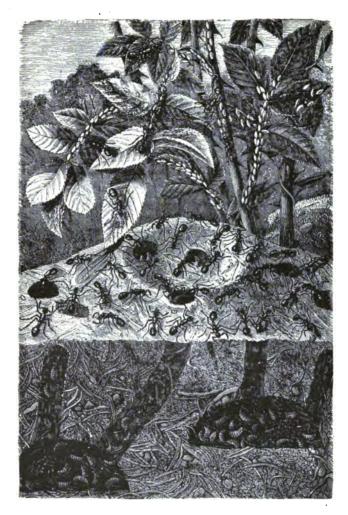
Yet the queen cares so little for the outside world, that she throws off her four small wings; and then she lays her eggs in the nest and goes to housekeeping in real earnest.

But if ever you chance to meet with her, beware how you hold her in your hand, for she has a sting!

As soon as the ants reached their home, or ant-hill, they each caught up a larval baby in their jaws.

These babies had been lying in the sunshine for hours; and as the ants caught them up, they carried them "down stairs" into the nest.

From the time the larvæ come out of the eggs,



SECTION OF AN ANT HILL.

till they spin their own cocoons, they are watched and fed with the greatest care.

The worker ants bring them up into the sunshine, and carry them down to the nest if it rains.

A good part of the sweet honey-dew, that they coax from their small cows, is fed to the little ones at home.

When the ants pat the plant-lice in such a coaxing way, they seem to use their antennae as we would use our fingers.

Plant-lice suck the sweet juices of roots and leaves; and this makes the honey-dew that the ants love so well to lap up for food.

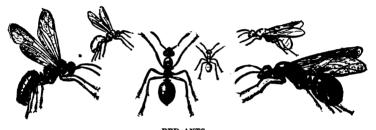
These small lice have antennae that are much longer than their bodies; so when we speak of them as cows, why are not the antennae their horns?

In the nest of the ants, there are many roads and small rooms; and the compound eyes of these insects must aid them in their dark abodes; for they have no light excepting the few rays that steal in at the openings of the hill, above; and yet the

compound eyes of the ant are not as large as they are in most other insects.

But besides the compound eyes, both the queen and drones have three simple eyes.

Like their cousins, the bees, there are, among the ants, Masons, Carpenters and Leaf-cutters.



RED ANTS.

MALE, WORKER, AND FEMALE (magnified, and natural size.)

Sometimes a large number of them will run up into a tree and cut off the leaves with their sharp jaws; while a squad of others will wait below to gather up and drag away the spoils.

As the large ants are running away with a broad, green leaf, very often some of the smaller workers will quickly creep on, and steal a ride home.

Those who have studied the most about ants

and their habits, class them among the wisest of insects.

They know how to wage war upon one another, and how to make slaves of their prisoners; they make their slaves feed them, and carry them about on their backs.

They have soldiers among them, too; and these are placed as guards to watch over the nests.

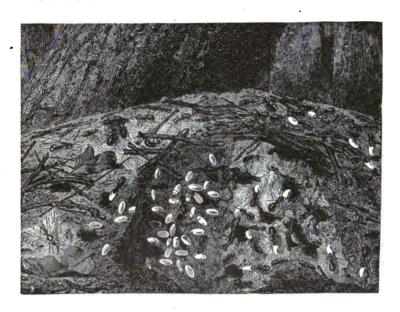
In some parts of the world, there are ants that build a hard, smooth pavement.

On this, they raise mounds, sometimes a foot high; these are their houses, and the spaces between them are like nicely paved streets.

Inside of the mounds are many cells, or rooms; and here may be found their eggs, their babies, and also their stores of food.

There are still other ants that can sow seeds and harvest their crops. These ants are mostly found in very warm countries.

But the little ants that we see running about the roads and fields are also very wise. They are so wise that they will even take their small green cows down into the ground with them, when the cold weather comes on.



NEST OF THE RED ANT.

And there they house them, near the tender roots of a tree, where there will be plenty of sweet juices for them to suck.

In this way both the cows and their owners will be sure to have enough to eat through the long winter. They even build small sheds over them to keep them safe and warm; and if the plant lice have any enemies near by, the ants will make haste to destroy them.

There are not many queens, and there are but very few drones to be found in an ant's nest during the winter.

But if there happens to be more than one queen in the nest, they do not fight; they are not like the queen bees; they are not jealous of one another.

Some ants live to be eight, and even ten years of age; but this is only when they are kept, and cared for by some person who wants to study their habits.

They will feed upon meat, fruit, and seeds, as well as upon sweets.

They have strong jaws for biting, and can easily bite off the heads of their enemies when engaged in battle.

Bees, horntails, saw-flies, "trackers," hornets, wasps and ants, all belong to the same Order of insects.

<sup>\*</sup>Ichneumon Flies.

<sup>†</sup>Hymenop'tera. It means Thin Wing, or Membrane Wing.

### REVIEW.

We have now learned many things about the seven general Orders\* into which the insect world is divided.

First we had the Two-Wings; and in this Order† we found many kind of flies, gnats, mosquitoes, daddy-long-legs, and fleas.

Next we learned something about the Half-wings‡; and among them we found the "true bugs," such as we often meet in the fields and gardens.

In this Order we also met a wandering Vagabond and some of that idle stroller's friends.

And then came the Straight-Wings, the Order§ that shows us the grasshoppers, crickets, locusts, and many other insects.

<sup>\*</sup> These are usually grouped into Sub-orders; but that is a long word for little readers; so we use the shorter term.

<sup>†</sup> Dip'tera. It means Two-Wings. See Book I.

<sup>†</sup> Hemip'tera. It means Half-Wings. See Book I.

<sup>§</sup> Orthop'tera. It means Straight-Wing. See Book I.

After these, we had the Scale-Wings, in which we found our handsome butterflies and moths. Yes, and here we find, too, that small pale yellow moth that darts in and out, and lays her eggs in our woollens and furs; this is the clothes moth.



WHITE ANT.

Here is a picture of a White Ant; her body looks like a large fruit-pod; this is because it is so full of eggs.

Next, Mrs. Lace-Wing gave a party, and we met there all the insects belonging to the Nerve-Wing Order. You will remember that she had a small White Ant at her party; this white-winged insect is called an ant, but it does not belong to the ants proper. It may often be found under stones, sticks, and in stumps; these white ants are hungry creatures.

There are some kinds that will get into a room where there are chairs and tables, and there they will gnaw into the legs and other parts of such furniture, so that after a time, it will fall to pieces; they do much harm to almost every kind of wood.

After Mrs. Lace-Wing's Order, we had the Sheath-Wings, and our Rove beetle invited all the insects of his Order to take a journey with him around the world. And finally we reached the Thin-Winged Order or Membrane-Wing as it is called; and you have found out some curious things about them in this lesson.

It is said that there are at least, as many as six insects to every plant.

Now as most insects are harmful, in one way or another, the very best that we can do, is to study them and their habits so closely, that whenever we chance to fall in with them, we shall be able to know our friends from our enemies.



## LITTLE HOMESPUN'S ROBIN.

Two fair little maidens with ringlets of gold

And cheeks like June roses, sat under a tree;

Lithe, graceful and dainty, each formed in a mold

Of marvelous beauty, a picture to see.

One wore the soft robes that fall only to wealth,
Rich velvets and laces her deft figure clad;
The other bloomed gaily 'mid roses of health,
Content with plain homespun, her heart was so glad.

Just then a tame robin flew up to the nest

That swung, zephyr-rocked, on the bough of the tree,

Her mottled brown coat, and her trim scarlet vest

Just suited her style, one could easily see.

- "That robin is mine, mine forever to keep,"
  Said plain little Homespun; "but wait and some day
  We'll climb to the nest and I'll give you a peep
  At four little eggs, when the bird is away."
- "I'll buy the sweet bird and her nest in the tree,
  And give you the money; oh, won't it be fine?
  Then you will have velvets and laces like me,
  And you can wear dresses as costly as mine."

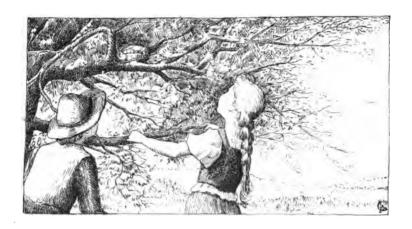
Two round pearly drops sprang to Homespun's blue eyes,
"I'd rather go hungry and shabby," she said,
"Than part with my birdie that every day flies
Right under my window for crumbles of bread;

"I know that your velvets and laces are fine,

I know I am poor, just as poor as can be;

But though you wear clothing more costly than mine

You can't buy that robin's nest up in our tree!"



### A YOUNG NEST THIEF.

One day two little children were at play in a shady grove; these children lived in Germany, and they were twins.

The name of the boy was Karl; and his sister was named Karoline. (Karoleene.) We would call her Caroline.

.They had been gathering wild-flowers, and were sitting under a tree, putting their flowers in small bundles, to sell in the market.

All at once they felt a strong gust of wind

sweeping over their heads; and as they looked up quickly, they saw a mother-bird flying straight to her nest on a low branch of the tree.

They sat very still without speaking a word; for they were good children and they did not want to frighten the timid bird.

In a little while she flew away; and then they both crept on tiptoe to the low bough of the tree and peeped into the nest. There they saw three small birds that looked like fluffy yellow balls.

After that, they went day after day to peep into the nest; and by-and-by the mother-bird did not seem to be afraid of them at all.

Sometimes she brought her darlings a fat worm, and sometimes a small insect; they were always hungry, and would "peep, peep" for more, before she could get the tidbits into their mouths.

One day as the children were returning from a visit to their pets, they met an idle fellow who did nothing but go about, robbing birds of their eggs, and often of their young.

As he passed along, they watched him very carefully; but as he did not even look toward the tree in which the nest was hidden, they felt that it was safe.

But the next day, when they went to make their usual visit, they heard the mother-bird giving quick, sharp cries of distress long before they reached the tree.

She was flying from bough to bough, as if in search of her little brood; and as she flitted about, here and there, she kept up her sad, shrill cry.

The children peeped into the nest and found it empty. Then they knew what had happened.

It is said that birds have been known to shed tears at the loss of their young.

I do not know whether this poor mother-bird shed tears or not, on account of the cruelty of the boy-robber; it may be that she did not.

But I do know that Karl and his sister wept so bitterly that they were hardly able to tell their mother the sad story when they reached home. Birds have other enemies besides the cruel boys that go about robbing them of their eggs and of their young.



Snakes have been known to find their way to the nest of a bird, even when it had been well hidden in the forks of the boughs.

There is a small striped snake, called the "coachwhip," that will crawl up the trunk of a tree, twine itself around a twig just near enough to the nest to reach its head in, and help itself.

Then too, there are the hawks, and jays, and



owls, and that fierce butcher - bird from which the little nestbuilder hides in terror.

I once read of an owl that was caught and chained fast to a post.

Then came a large number of little birds, whose homes he had robbed, to look at him.

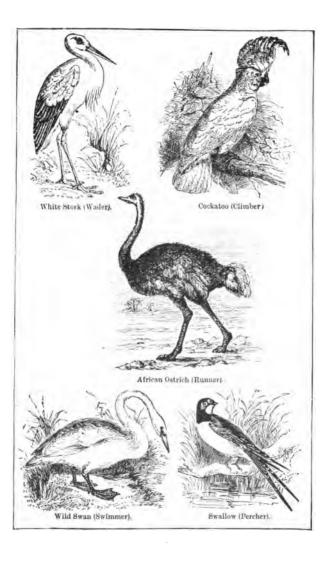
And when they saw that he could do them no more

harm, they flew about his head and chirped with joy.

I know some German children that believe this story to be true.

They even believe that the little birds called the chained robber bad names. Be this as it may, they had good reason for being glad that he was eaught.







THE BAGLE

#### SOMETHING ABOUT BIRDS.

### PART I.

When we look at a bird, we see its head, its eyes, beak, body, wings, tail, legs, claws, and feathers; and is this all?

Yes, this is all we observe in the general make-up of the animal.

But are all birds alike? Do they eat the same kind of food? Do they build the same kind of nests?

Do they lay the same number of eggs, and how

are they able to fly so high in the air, and to remain so long on the wing?

These are some of the questions to which we ought to find an answer; and we will try to answer the last question first.

The framework of a bird's body is very light, as the bones and the quills are, for the most part, hollow; and this allows the air from the lungs to pass through the body.

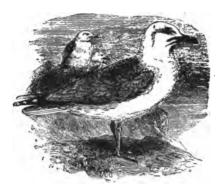
It is no wonder then, that a bird is so often called an air-boat; and very beautiful boats some of them are, too.

Birds use their wings as if they were strong oars; and when they beat the air with them, their bodies are pushed forward, while the stiff feathers of their tails act as a rudder to guide them in their flight.

Long winged birds can fly farther in the same time than those that have short wings; for they do not have to make so many strokes with them, and so they do not tire out so easily.

Such birds spend their lives hundreds of miles

from land; they are swimmers, and when tired, they can rest on the water.



SEA GULL.

The gull, the stormy petrel, and some others, are of this kind.

The wings of birds are really their arms; and the tip end of the wing is often called the bird's hand.

A bird that has very long legs, also has a long neck; for if this were not so, it could not easily get its beak down to the earth in search of food.

Most birds have four toes, three of which point forward, and one backwards; but there are birds that have but three toes, and some have only two. The Ostrich of Africa has but two toes; and yet it is a very swift runner.



OSTRICH.

The claws on the feet of some birds are so large and strong that they are called talons; but the claws, beaks, and feathers of birds are only different forms of the scales that clothe their legs.

The ears of birds are small openings so covered

with feathers that they are not seen; but the eyes



FOOT OF THE OWL.

are usually large and bright. On each side of the upper part of the beak is a small hole; these are the nostrils.



FALCON.

Birds of prey have hooked beaks, and strong talons; some of them fly by day, and others, by night.

Among the Day-fliers are the eagle, hawk, vulture, falcon, and buzzard.



THE KING VULTURE.

The owl is one of the Night-fliers; its feathers are very soft, so that it makes but little noise with its wings.

Birds of Prey live on flesh, and hunt the forests for birds that are smaller than themselves; they also devour other small animals, such as insects, rabbits, and mice. Birds have tongues, but no teeth; they have no need of teeth.



EAGLE OWL.

Let us see why.

They take the food with their bills; it passes down the throat into a small sac, called the crop; from the crop it goes still farther down into the stomach.

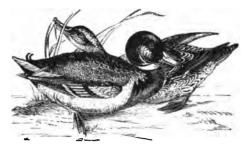
One portion of the stomach contains a liquid, and here the food is softened; then it passes to the other portion, called the gizzard.

This gizzard is lined with a rough, horny layer, and here the food is ground very fine.



BARN OWL.

As this rough, horny layer takes the place of teeth, it may be said of a bird that he carries his teeth in his stomach.

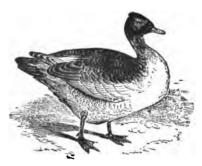


DUCKS.

# SOMETHING ABOUT BIRDS.

#### PART II.

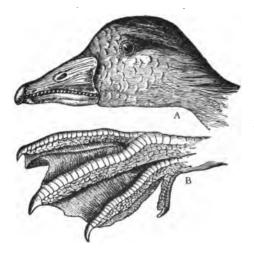
Birds that live mostly in the water have webbed feet, and are classed as swimmers.



THE GOOSE.

Among these, we find the duck, the goose, and the swan.

If you look at the feet of such birds, you will find that the toes are joined by a thick, tough skin; this is called the web.



SWIMMING BIRDS.

a. Head of Gray Goose.

b. Foot of Domestic Goose.

The beaks of the goose, duck, and swan, are set along the edge with small ridges that look like spiny teeth; they are sharp and strong.

When such birds dine, they eat with a spoon, as you can readily see by the shape of their bills.

Do they not look like a spoon?

But the greater part of our barn-yard fowls have feet that are made for scratching in the ground.



PEACOCK.

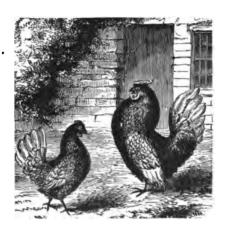


TURKEY-GOBBLER.

Among these we find the strutting male peacock, as well as the turkey-gobbler with his purple-red wattles hanging from his throat; and his long beard down low on his breast.

And here also we find the shrill-voiced cock, wear-

ing a bright red comb on the top of his head, and sharp, horny spurs on his legs.



The females of this class are not so gaily clad; if they had fine feathers they would not have much time to display them; for they are mostly busy in looking after their nests, and in hunting food for their young.

There is one queer looking Swimmer, called the Grebe; she makes a nest on which she can sit and float upon the water; and sometimes her young ones ride upon her back.

She commands her own craft, and takes none but her own family with her, on her long sailing trips; she



GREBE.

can use her feet for oars; and as they hang down behind her back, they look like small paddles. Birds that plunge into the water and are able to swim under the surface, are named Divers; these birds have solid bones.



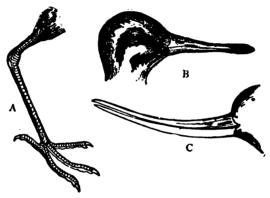
HERON. (WADER.)

They have no need of light bones, for they make no journeys in the air; the Loon is one of this kind; he is a famous diver.

The Pelican is a good fisherman as well as an expert diver. Sometimes he will catch a hundred or

more small fishes, and these he carefully stores in a large pouch on the under jaw.

Like other fishermen, he may come home with a wet coat, but his game-pouch is never empty.



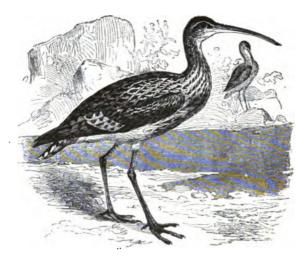
HEADS AND LEGS OF WADERS.

Both Swimmers and Divers are clumsy walkers on the land.

There is another class of birds called the Waders; they sometimes look very funny, stalking along the seashore and the banks of rivers, on legs that look like long, slender rods, spread out into claws at the base.

Sometimes they will pat the ground hard with their

feet; and then out will peep a worm or an insect to see who is tapping at the door.



CURLEW. (WADER.)

In an instant it is snapped up by the Wader's long bill, and then he taps for another; very often he will make out a good meal on snails and other small animals that he finds in the sand.

One of these long-legged birds is well named the Stilt; for no boy can walk on high stilts as safely as he.

The feet of some birds are made for grasping the

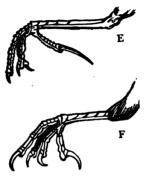
twigs of trees as they pass from bough to bough; these are called Climbers; and here we find woodpeckers, parrots, and some others.



PARROT.

Birds whose feet are formed to grasp a twig or stick on which they rest, are called Perchers; and among these, are our finest birds of song.

But all Perchers are not singers. The king-bird, the little tyrant of the woods, is a Percher, but he is by no means a singer; in Book Third you will find a poem about him. He is allowed there to sing to the other birds of his daring deeds; but that is only to make the poem prettier; for the very best that he can do, is to utter a few harsh notes, that are not at all like a song.



e. Foot of Yellow Wagtail. f. Foot of Finch.

Most birds carry an oil-bag under the skin; and you will often see them reaching their bills way back toward the tail, and then they will rub them over their breasts, and other parts of their bodies.

Some people, when they see them do that, will say, "It is going to rain; the birds are oiling their feathers."

Once a year, at least, birds shed their feathers, and then, even the finest songsters refuse to sing; but when new soft feathers grow into the places of those that have fallen off, then the little warblers are as happy and as full of song as before.

As a general thing, birds that wear the plainest suits are the best singers; and male birds sing more than the females; but they may well gladden us with their songs; for they have no family cares to keep them busy!



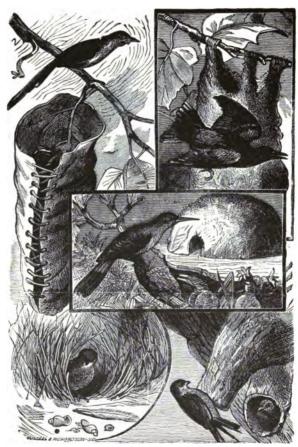
PARTRIDGE.

Some birds drop their eggs about in the sand; some hide them in holes in the rocks, in the ground, or in hollow trees.

I once knew a boy who brought from the woods a nest full of partridge eggs and put

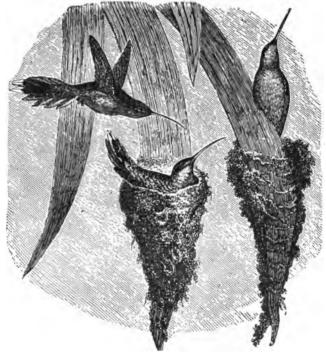
them under a sitting hen.

The eggs hatched out, but the poor hen could do nothing with her wild family; she clucked and called, but all in vain; and one day they ran away into the woods and never came back!



SOME CURIOUS NESTS.

There are some birds, like the partridge, that build their nests in the ground; but this is not safe; for nest robbers often set traps for them.



HUMMING BIRDS.

One of the prettiest nests that is made, is that of the humming-bird, — the baby-home among them all! Birds are very helpful in the way of scattering seeds; and by their aid, many a lonely island has been covered with trees and with grass.

I could tell you many things about birds with long bills, long necks, long legs, and very long names.

But there have been hundreds of books written about them.

And I am sure that you will read some of these and then you will learn much about the homes and habits of birds that will be of great interest to you.





# LOST TREASURES.

High on the limb of an old cherry tree
Sang a ground robin at morn's early peep,
While just beneath her, as snug as could be,
Nestled four dear little birdlings asleep.

Tall o'er their heads the red timothy rose,—
Just like a forest the long grasses stood;
Safe from all danger the nest to enclose,
While the fond mother went searching for food.

Oh, how each clamored and stretched up its beak,
Soon as she flew panting homeward once more,
Down 'mid the grasses her darlings to seek,
Laden with tidbits,— a plentiful store.

Sometimes on tiptoe I ventured to look

Down at my pets in their snug, mossy nest,

Praising the gold of each sweet open throat,

Stroking the down of each fair glossy breast.

But as one morning the meadow I crossed,

Lo, mother-bird rent the air with her cries;

What could it mean? Had her darlings been lost

Trying to plume their young wings for the skies?

Searching, I read her wild notes of distress,

Just o'er the heads of her innocent brood,

Some cruel vagrant a reed-trap had placed,

Frightening the old bird away with her food.

Quickly I caught up the treacherous snare,
Ah, my heart bleeds as I tell you the rest,
Mother-bird came, but she found only there,
Four little skeletons starved in the nest!



One day as I was rambling about, I chanced to come upon a young lad who was sitting on the bank of a clear stream, bordered with tall catkins.

He had a fishing pole in his hand, and a small basket strapped to his shoulders.

"What do you expect to catch, my boy?" I asked, after watching him for ten minutes or more.

"I expect to catch a fish that has a gold ring inside of it," he answered, without looking up.

"Ah," said I, "are there many such fish as that in this stream?"

"I know of only one," he said, "and that one swallowed a small gold ring that a lady lost here yesterday."

"And do you really believe that it was eaten by the fish?" I asked, trying to look as grave as possible.

"I know that he swallowed it," replied the boy, "for I saw him snap it up."

Just at that moment there was a nibble at the bait, and the young fisherman quickly drew in his line.

On the hook was a shining minnow, only a few inches long.

As soon as he could get it free from the hook, he whisked out his jack-knife and cut open the fish's body.

But alas! there was not a sign of any gold ring to be found.

This did not discourage him, however, for he dropped his hook into the water, again and again; and every time that he drew up a shining minnow or a fat chub, he would open its body and examine it very carefully.



Finally, he gathered up his bait, and was about to throw the few small fishes that he had caught, back into the stream.

"Come with me, my boy," said I, "and bring your fish with you; and may be we can discover something about them that will look quite as pretty as the shining gold ring that you hoped to find."

Then I took one of the tiny scales and placed it under a lens \* or glass, and asked him to look at it very closely.

"Oh, I see a thin piece of pearl, speckled all over with gold," he cried. "From which one of the fish did you get that?"

And when I told him that every shiner in his basket was covered with hundreds of just such handsome pearls, he found it hard to believe my story.

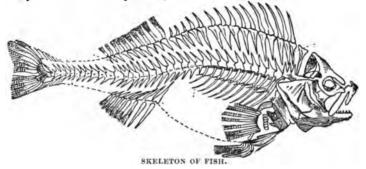
Very soon he forgot all about the lost ring, and asked me many questions about fish and about their homes and habits.

And now I will tell you very briefly just a few of the facts that he learned about fishes that day.

I shall tell you only a few, and then if you want to learn more about the "finny tribes" as they are sometimes called, you can study about them in higher books, when you are older.

<sup>\*</sup>It would be well for the teacher to explain how the microscope enlarges the size of objects placed under its lenses.

The head of a fish is joined to its body without any neck between the two parts; and the skeleton of many fishes is very bony.



The eyes of most fish are large, and the mouth is armed with spiny teeth; some of them have teeth on the tongue and also in the throat; but there are fish that have no teeth at all.

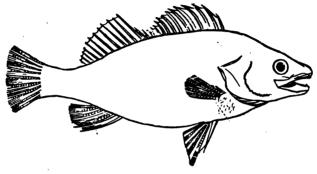
Some of the fins are arranged in pairs,—others are single; and some fish have none.

Wherever the fins are arranged in pairs they answer to the arms and legs of other animals.

All fish breathe through gills, but there are some kinds that have both lungs \* and gills.

<sup>\*</sup>The teacher should here explain the office of the lungs in animals and the necessity of breathing pure air.

They take the water in at the mouth, and send it out at the openings of the gills; but when they do this, they hold back all the air that was in the water; for every animal must have air, whether it lives on the land or in the water.



OUTLINE OF FISH.

The gills are small, thin plates, that often look like fine fringe; and the lid that shuts over them upon the outside is called the gill-cover.

Inside of the fish's body is an air-bladder, and by means of this, the fish can rise to the surface, or float near the bottom of the water, whichever pleases him best.

The scales of some fishes are like thick, horny

plates, but there are fish that have no scales; the colors of many of them are as beautiful as the gay plumage of the finest birds.

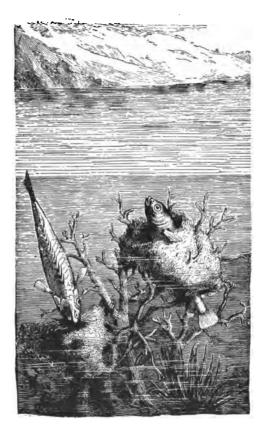
Most fish live on animal food; but there are a few that feed on seeds and plants.

Their eggs are called "fish-roe;" and some kinds are much used for food.

Sometimes the mother-fish lays her eggs in a deep hollow in the sand, at the bottom of the sea; this hollow is first carefully scooped out for her by the father-fish; and after the eggs are laid, he not only guards them with the greatest care, but he looks well after the baby-fishes that hatch out of them; and swims about after them as they dart about in search of insects and worms.

There is one kind of fish called the stickleback, and they are well named; for some of their fins are so sharp that they will stick into your flesh like thorns.

The father stickleback takes great pains in building a nest of sticks, leaves and sand, for the eggs of the female fish.



STICKLEBACKS.

And would you believe it? He has to watch over the baby fish as soon as they are hatched, to keep their own mother from making a dinner off them!



SALMON LEAP.

There are some fish whose homes are in salt water; but they will swim a long way to lay their eggs in a fresh water nest.

In order to do this, they must sometimes leap ten or twelve feet upward, if there happens to be a high fall of water in their way.



SHARKS' EGGS.

The eggs of some fish are laid in bands or ribbons that float on the surface of the ocean; others enclose their eggs in strong cases and tie them to stems or to weeds in the water. But the most curious fish-nest that I have ever heard of is the mouth of the father-fish.

I have read of one kind called the Chromis. This fish is not more than seven or eight inches long and its body is not very thick.

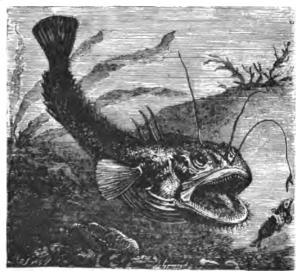
Its back is olive green, barred with blue; and its belly is of a silvery lustre with green and blue spots.

The mother-fish lays her eggs in the sand, or, sometimes between the tufts of reeds; then the father-fish swims towards them, and takes a very long breath, and so draws them up into his mouth and gills.

Happy Mrs. Chromis! she has no farther care about those eggs of hers; they hatch out, but they will be safe in their father's plated gills.

Finally they appear; there is a large number of them, and one would almost suppose that the open jaws of the father would close upon them.

But not so; he is altogether too careful for that, and the little family grow and thrive in their safe, warm quarters, till they are old enough to swim forth into the wide waste of waters and take care of themselves.

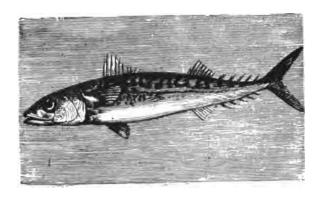


THE ANGLER.

What a brave little father he must have been, to keep from swallowing such a sweet morsel; for it is the nature of fishes to prey upon one another.

There are some of the finny tribe that have very queer ways of catching their prey; there is one kind called the Angler; it also has other names, as Widegab, and Fishing-frog.

This is a very large fish, having slender rods on the head; at the end of these rods are long, waving tassels that look like worms.



THE MACKEREL.

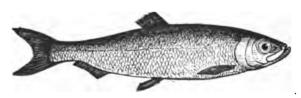
This creature hides itself in the mud, and slowly moves its tassels; smaller fishes, seeing the supposed worm, swim within reach of them, and are at once seized, and swallowed down the large throat of the Angler!

There is another fish that uses its mouth for a pop-gun; it swims very near a reed or a blade of grass on which a fly or some other insect has lighted, and shoots a drop of water from its snout straight at the insect.

This causes it to fall off into the water, and the fish snaps it up in a twinkling.



THE COD.



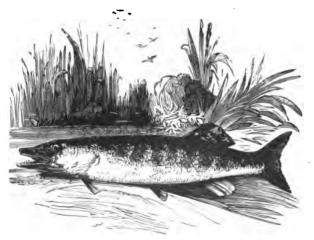
THE HERRING.

I could tell you many strange things of fresh water fishes, and of the huge swimmers that are found in the ocean.

But you will read, and find out for yourselves

all about the cod, the mackerel, the sturgeon, and that terror of the waters, the man-eating shark.

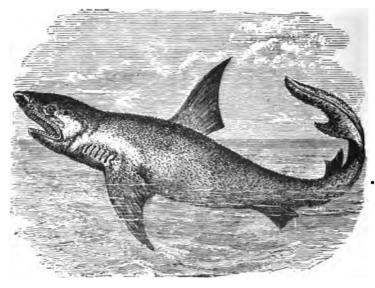
This monster has large movable teeth; if one falls out, another takes its place, and the older the animal grows, the more teeth he has in his mouth.



PIKE.

I do not know whether my little fisherman ever caught the shining minnow that snapped up the missing ring; but I do know that from that day on, he took great pains to learn all that he could about the homes

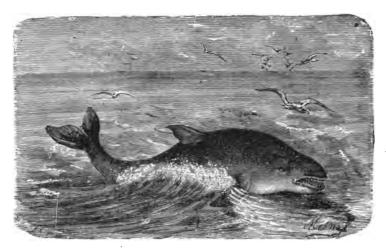
and the habits of fishes; and he now has a large



SHARK.

aquarium\* of his own, filled with scale-clad beauties of the choicest kinds.

<sup>\*</sup> It will be well here to describe an aquarium and explain in as simple a manner as possible why it is so-called.



THE COMMON PORPOISE.

### IN SEARCH OF A DINNER.

"What shall we have for dinner, to-day?" asked a fat porpoise\* as she flitted swiftly along in the midst of her large family, just under the surface of the sea.

She had a goodly number of children, and they were all of them dressed very nearly alike.

They wore smooth coats of a pretty blue-black, and long bibs of silvery white.

<sup>\*</sup> Pronounced Por-pis.

The children were not very large; but the mother was at least six feet in length; and her coat was a trifle darker than those of her young ones.

When they were babies, she fed them with her own milk, after the fashion of her large cousins, the whales, and of her half-sisters, the dolphins.

Now although the porpoise, the dolphin, and the whale, have fish-like bodies, and finny tails, yet for all that, they cannot be classed as fishes.

Fish breathe through gills, and these animals have lungs; the bodies of fishes are covered with scales; these animals are naked.

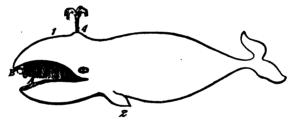
Fish never suckle their young; and these animals do; besides this, there are many other points in which they are not alike.

But these young porpoises, of which we have been speaking, were now old enough to hunt about for their own food.

So when the mother asked, "What shall we have for dinner to-day?" one said, "A sprat," another, "A herring;" while a third cried out, "Let's have a flying fish, I'm sure that nothing can be any better than that."

"Agreed," said the mother, "but you must all of you watch, sharp; for it is not so easy to catch one in these rough seas."

Then up spoke one lazy little porpoise, in reply, and said, "Our large cousins, the whales, do not have to work so hard for their food, and why should we?"



OUTLINE OF WHALE.

Now when whales are hungry, they have only to drop the lower lip, and then small fish, and everything else that they like, swim right into their mouths.

And those that have whalebones hanging from the upper jaw fare better still.

For the fringe on the edges of the whalebone,

sifts the water out; and, as the little porpoise said, they do not have to work for their food.

So instead of looking out sharp, as his mother had told him to do, he did nothing but jump about and wish that he was a whale.

"As you are only a very small porpoise, and not a whale," said his mother, "the best thing that you can do, is to stir yourself a little more nimbly, and be on the look out for your dinner."

And with that, she gave him a smart slap with her finny tail.

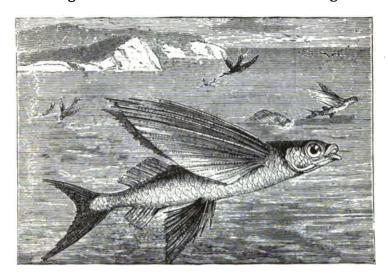
This set all the other young ones to jumping up and down with glee; and they chased one another about, and turned somer-sets for half an hour, before their mother could make them settle down again to watch for the fish.

Just as they had become quiet, the mother gave them a sign that there was a flying-fish not far away; and so they all kept very still and waited for their prize to swim a little nearer.

Now the side-fins of a flying-fish are very large

and broad, so that it can move them up and down, something as a bird beats the air with its wings.

**.**V



A FLYING FISH.

And when their enemies dart toward them, these fish leap into the air several feet above the water; but their flight is very short, only a few seconds, at the most.

As they spring from the water, their large, clear fins make a rustling sound; and their handsome purple backs gleam in the sunlight. Now it so happened that a fine, white albatross, one of the largest water-birds in the world, chanced also to be looking about in quest of his dinner.

He had been for several days on the wing, and was very hungry.

What was his delight then, when he saw a shining flying-fish leap out of the water so near to him that all he had to do was to stretch out his neck, and seize it with his strong bill!

And so the porpoise and her hungry family lost their prize; while the poor fish, in jumping up to escape his hungry foes in the water, found a still more powerful enemy in the air!







### FOOD HUNTERS.

#### PART I.

Animals, plants and stones, all have a story to tell, if we but listen to them.

Let us make friends with them, then, so that we may hear what they have to say.

"But how can we make friends with a rock? What has a rough, hard stone to talk about that will be of any interest or use?

Let me tell you.

One day early last spring, I went out into the woods and the fields for a short ramble.

The earth was hard and bare; the sharp edge of the rocks could just be seen above the thick mantle of snow that lay about them; and the forests and fields were cold and silent; for the birds were far away, holding their concerts in a warmer clime.

A few weeks later on, I went again. After strolling about for a while, I sat down at the foot of a steep ledge; and what did I find?

I saw a carpet of green moss that was spread so thickly over the sides and top of the ledge, that scarcely a bare spot-could be seen.

Then a hollow voice within the rock seemed to say:

"I am old, very old; I have stood in this spot since the world began.

"I have been warmed by the sunshine, and I have been pelted by the storms; I am broken into ridges and seams; and little by little, I find myself crumbling away.

"But see what the busy fingers of the mosses

have done for me! Behold the soft mantle of green velvet that hides my ugly form!

"Now the creeping vines will visit me; and small way-side flowers will clamber up my rugged sides, and sit down here and there about me, content to stay.

"The shy ground-bird will build its nest at my base; and little children will gather around me and weave their bright garlands of spring blossoms."

"But why did the busy finger of the mosses do all this for the cold barren rock?" I hear you ask.

I reply that these little workers are in search of food; and their way led them over the sides of the naked ledge; for rain, sunshine, and little or no earth, is all that such plants require; although there are some kinds of moss that seek far and wide for better fare.

As I glanced upwards I saw a small birch tree growing on the topmost point of the rock; it began its life in a very small spot, and where there was but little earth for its roots to feed upon.

What better could it do then, since there was no food on the rock, than to send its roots down the rough sides of the ledge in search of what the rich, moist earth alone could give?

And so down they came, looking like strong, brown cords, and when they had reached the ground, their length was equal to the height of the tree itself.

Slowly, very slowly, they crept down, till they found in the earth just what the little birch needed most, standing up there all alone, and nearly ready to faint for lack of food.

As I wandered on toward the forest, I came upon a number of fine, creamy mushrooms that seemed to be growing in a circle.

I found them in an open space where a few golden sunbeams could steal in and throw their cheerful light upon them.

All at once I remembered that I had read of

the Fairy Ring and behold, here I had found it! It is said that the fairies dance within this circle by moonlight.



"But how did they happen to be growing in just this way?" you inquire.

A single mushroom took root in this spot, and soon it sent out rootlets, first on one side, then on another, until it was at last surrounded by a circle of its own kind.

Its small rootlets went food-hunting, and so the Fairy Ring was formed.

But while some mushrooms may thrive in an open space, there are other kinds that will not creep out beyond the edge of the dusky timber



land; there, their rootlets stop spreading, and begin to turn back again into the shady woods.

After I had entered the thick forest and stopped for a moment to rest, I heard a faint moaning and sighing among the trees; and then the sound died away in the air.

As I stood very still, trying to listen, I thought I heard a low voice say, "I am so very tired. I cannot take a single step farther. I must rest now, until another year."

I glanced about me and soon discovered a pretty Walking Fern.

She had bent over and reached her long narrow

leaf (frond) down to the earth, and from the very tip end of this slender frond, several small, rootlike fingers had fastened themselves into the soil.

Another year, and a baby-fern-leaf will peep out of the ground; and that will in turn start on its journey for food; and so year after year will pass, and each year a new food-hunter will be added to the family of the Walking Fern.

Have you ever seen the crab-grass, or finger-grass, as it is sometimes called?

It is common enough, growing about almost anywhere.

Pull it up by the roots and turn it over, with its rootlets pointing toward the sky.

In a short time, new rootlets will be formed under the old ones, and they will soon find their way down into the moist earth; the plant is struggling to live; and its roots know how and where to search for food.

Do you know the homely pigweed? It is sometimes called goose-foot, and sometimes lamb's-quarters.

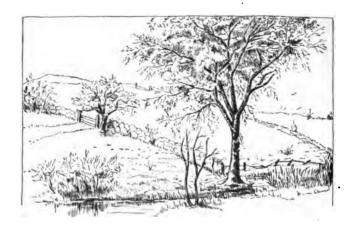
Tear it up and out of the soil, and lay it down flat upon the ground; place the stem very low down as it lies there, and let its rootlets turn skyward.

It will not be long before the roots will turn over and curve downward until they finally take hold of the soil.

The top of its stem will then slowly curve upward, and oh, what an effort it will make to rise into the air and sunshine!

And sure enough, when its toes have worked their way well down into the earth once more, the stem will begin to raise itself; slowly, slowly, it will rise upward till it is nearly or quite as erect as it was before.

You have not killed the worthless weed, after all.



#### FOOD HUNTERS.

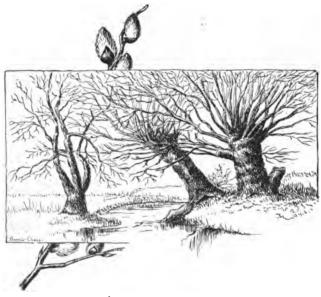
#### PART II.

Thus whenever you chance to walk in garden, forest, or field, you will be sure to come upon one or more of these restless, hungry food-hunters.

Some are seeking one kind of food, and some another.

I have been told of a tall elm-tree that sent its roots a long distance under the bed of a deep ditch, in order to reach a pile of table-crumbs and other waste matter that had been heaped up there, to be scattered over the garden to make the soil richer. This pile of scraps had stood there so long that a dark mold had gathered upon it.

This mold is also a form of plant-life, and a food-hunter, as you may suppose.



Now there was something in that black, moldy heap that the young elm needed for its support.

But had a willow tree been growing there in the place of the elm, it would have sent its roots straight to the bottom of the ditch.



SWEET-PEA.

For willows are moistureloving trees; and their rootlets will travel a long distance for a drink of clear, cool water!

Many plants seek support as well as food; among these are the columbine, morningglory, peas, beans, and others.

The slender pea-vines will climb up and up, till their knotted tendrils look like tangled skeins of green sewing silk.

Others, as the strawberry, send out their swift runners along the ground; while the wild buckwheat clambers over hedges and rough stone walls as if it were in great haste to get away from itself.

And have you never seen

the ugly dodder coiling its leafless stem around the stalk of other plants?



Closer and closer it clasps the frail, helpless stalks, as much as to say, "Now I have you fast, and you must feed me."

There are quite a number of food-hunters, that,

like the yellow dodder, drain the juices of other plants for their own support.

They will sometimes strike their roots into the bark and the wood of a strong tree, and there live and flourish on its sap; one of these thrifty food-thieves is called the mistletoe.\*

Again, there are some kinds of plants that will grow and thrive, if they have nothing to live upon but air; the dark gray moss that is often found hanging from some trees is of this kind.

This plant has long, thread-like stems and leaves, with small, green flowers sitting close upon the stem.

It does not belong to the moss-family at all; but because of its hanging in long festoons from the trunk and the boughs of trees it is called "Long moss," and sometimes "Black moss."

Besides this air-plant, there are many others that live in the same way; and some of them bear handsome, showy blossoms.

<sup>\*</sup> Pronounced miz'-l-to.

You have already learned about a few kinds of birds and insects that spend a good share of their lives in, and about the water; and so it is with some kinds of plants; among them is the water-lily.



WATER-LILY.

This beautiful plant fastens its roots in the bottom of a pond or stream, and sends up its round, hollow stem to the surface.

There its white, waxy flowers, surrounded by shining green leaves and half-opened buds, rest gracefully upon the water, drinking in the air and the sunshine as its growth may demand.

Here, too, along the shore, we may find the sharp, sword-like leaves of the sweet-flag, and, may be, a few of the savory mints that we gather from their watery beds.



SWEET-FLAG.

The under part of the leaves of most waterplants are covered with small mouths or pores that suck up their food as they have need.

But insects and other animals must also be counted among the food-hunters of the world; as

you have already learned in the lessons that have gone before.

And man, too, as well as the lower order of animals, must come in for his share of the food supply.

It follows, then, that this great world of foodseekers is made up of both animals and plants; and that while plants find every need supplied from the soil in which they live, man and the lower animals have a much wider range.

Plants get not only their food from the earth, but from the same source, from the dark, gritty soil, they get also the pretty colors of their stems, leaves, and blossoms.

It is true that the air and the sunlight have much to do with the depth and the richness of these colors.

For if a plant is shut out, for any length of time, from the warmth and the light of the sun, it loses its color and becomes faded and spoiled.

There is much to learn about the life and growth

of plants that every boy and girl should known many books have been written about them.

When you are older I hope you will studbooks carefully; for they will teach you alplants and their ways, from the time that the are hidden away in the ground, till their bloom and their fruits are ripened.



7/8.3. K29 V.2 INGHINK SIAHORD 621277

# To avoid fine, this book should be returned on or before the date last stamped below

50H-0-40

5/8.3. K29 V.2 621277 DATE Leaves from nature's story-book. NAME WALL STAND OF THE RIVER STANDARD NAKE 72 518.3 K29 ¥.2 621277

## Young Folks' Library of Choice Literature.

	I. Æsop's Fables. (Ilius, bds. 90 pp.)	.30
	2. Grimm's Tales. (Illus. bds. 144 pp.)	40
	3. American History Stories. Vol. I. (Illin. hes. 19 ap.)	.36
	4- " " Vol. II. (Illas, bds 158 p.).)	
	5 " " Vol. III. (Illus. t.ds. , 5. ).)	
	6. " " Vol. IV. (Illus, bris. 174 pp.)	.36
	7. Strey of Columbus. Illus, bds. (80 pp.)	.40
	8 stories of Industry, Vol. 1, (Illus, bds. 172 ] .	40
	9 " Vol. II. (Illus, bds, 176 pp.)	40
	10. Ethics: Stories for Home and School. (Bds 16: mm.)	.40
ı	11. Lattie Flower Folks, Vol. 1; (Illus, bds, 138 pp.)	,30
ļ	12, " Vol. II. (Illus, bils, 130 pp.)	-30
ı	13. The Great West. (Illus. bds. 176 pp.)	.30
	14. Cortes and Montezuma. (Illus. bds. 100 pp.) .	.30
	15. Pizarro; or the Conquest of Peru. (Illus, bds. 128 pp.)	.30
	16. Stories of Massachusetts. (Ilius, bds. 348 pp.)	.60
	17. Geography for Young Folks. (Illus. bds. 136 pp.)	30
	18, Storyland of Stars, (Illus, bds. 165 pp.)	.40
	19. Stories from Aminal Land. (Illus. qto, bds. 179 pp.)	.50
	20. Our Fatherland (Idas, cloth, 160 pp.)	150
	21, Stories of Australe c (Illus, bds. 220 pp.)	40
	22. Survis i India. (Illus. bds. 200 pp).	.40
	23 Stories a make peace. Vol. I. (Illus, cloth, 166 pp.)	150
	24. Vol. II. (Hlus, cloth, 150 pm.)	50

## L STATIONAL PUBLISHING COMPANY.

BOSTON.

NEW YORK.

